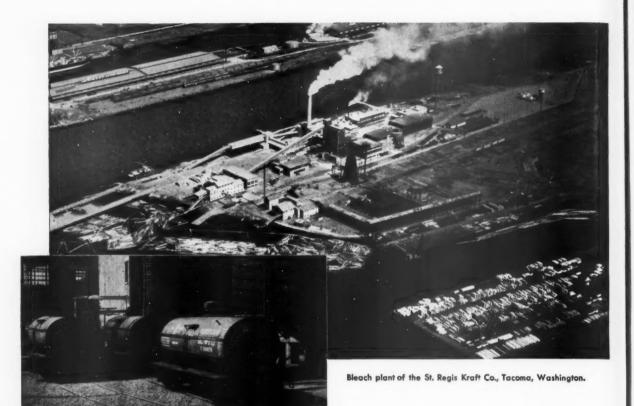


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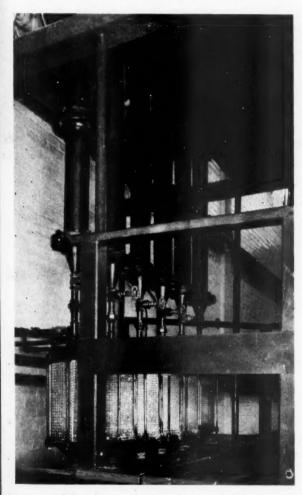
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Tariff Commission Sidesteps Wood Pulp Investigation

Declines to execute Senate resolution directing it to investigate the wood pulp situation (unless the Senate makes a second request) on the grounds that the war has changed conditions—Tariff Commission misses intent of the resolution which was to provide a basis for legislation to permanently alleviate the depression of American forest industries in peacetime—U. S. wood pulp industry vigorously protesting Commission's unwillingness to accede to the Senate's request.

THE United States Tariff Commission, which was directed last August by the Senate to investigate the wood pulp situation and report back by April 15th, declined to go ahead with the investigation unless the Senate makes a second request.

In a letter to Vice-President John N. Garner in his capacity as President of the Senate, dated October 2nd, Raymond B. Stevens, chairman of the Tariff Commission, flatly states, "... unless the Senate gives instructions to the contrary, the Commission proposes to withhold for the time being the completion of the report on wood pulp and pulpwood. We will, however, keep advised in regard to current conditions and report on them if at any time the situation seems to warrant such action."

Mr. Stevens' letter, as released by the Tariff Commission, accompanies this article as does Senate Resolution No. 160.

Commission Misses the Point

Senator Borah, who introduced the resolution, intended that the situation in the American wood pulp industry as of the end of July, and which had existed since the latter part of 1937, should be fully investigated by the Tariff Commission. As the Commission's previous report, requested in August of 1935, was not published in complete form until 1938, Senator Borah at first asked that the report be made to the Senate on January 15, 1940, in order that the data it would contain might be used in developing legislation for permanently eliminating the depressing influence of imported wood pulp on the United States pulp and paper industry. The Commission insisted that August 1st to January 15th was insufficient time so the report was scheduled to be made on April 15, 1940.

On page 7 of this journal's Au-

gust, 1939, number the following comment was made upon the anticipated report.

 "It is expected that the Tariff Commission's report will focus attention upon the inability of the American wood pulp industry to compete with foreign made pulp which benefits from low labor costs, low shipping rates and in the cases of European producing countires, from depreciated currencies, and that its facts will also emphasize the opportunity that exists for the development of the domestic industry as a heavy contributor to employment, as a stabilizing influence on American forest values and upon the prices of paper made from

"The Tariff Commission report, which is to be made to the Senate on April 15, 1940, will contain most of the facts at the root of the maladjustments in the American pulp industry and our entire forestry situation. The trouble is deeper than is generally realized. Likewise, its solution would benefit more people, create more permament employment than is expected even by many of those closest to the problem.

"The problem, involving trade with other countries, is a Federal problem, and therefore must be settled by Congress. On April 15, 1940, Congress will be in possession of most of the facts, of the latest evidence. Will it properly diagnose the trouble? What is more important, will it prescribe the remedies which will result in a cure?"

After the War-What?

• Although the outbreak of war in Europe reversed the wood pulp situation and sent American converting mills hurrying to buy all of the available American made pulp, the present conditions favorable to United States producers cannot last in-

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definitely unless defense measures are taken soon.

While we all hope fervently that the war will end shortly, the American wood pulp industry and the American paper industry do not want the return of conditions prevailing prior to September 1st.

We must recognize that the makers of paper are as seriously affected by low pulp prices as are the pulp producers. The paper industry cannot have stable prices for its finished products in the face of a chaotic pulp market. Their interests are mutual and fortunately this fact is being recognized by a growing number of pulp and paper producers.

It was D. Clark Everest, president of the American Paper & Pulp Association, who said in a talk at Savannah, Georgia, last April 18th, "After all, the price of pulp controls the price of paper and no domestic mill has ever made a satisfactory profit for any continued length of time on a low-price pulp market."

If we do not want these ruinous conditions to return we must endeavor to obtain legislation through Congress to protect both our paper and our pulp industries when the war is over. The protection must be planned and converted into law NOW before the flood of low-priced pulp resumes its flow into the United States. If we don't take warning from the depressions in the pulp and paper business in 1931-1935 and 1937-1939, caused partly by low-priced foreign wood pulp, we are going to suffer far greater hardships than the industries endured in those years.

At present the Scandinavian currencies are all tied to the dollar, the switch from the British pound having been made the latter part of August. Their relation to the dollar, at this time, is approximately upon the depreciated basis of last January. (See the January, 1939, issue of PACIFIC PULP & PAPER INDUSTRY.)

When the war is over it is logical that these countries, Sweden, Finland and Norway, will endeavor to sell more pulp than ever before to the United States and to Great Britain. Further depreciation of their currencies will be the easiest way of securing this business. They may realign their monies with the pound again. If they do this, we can be sure that the realignment won't be with a British pound worth the \$4.68 of last August, and possibly not even with a pound worth \$4.00, the present value. It may be much lower.

Senate Resolution No. 160

Introduced by Senator Borah and passed by the Senate on July 31, 1939.

"Resolved, That the United States Tariff Commission, under authority conferred by section 332 of the Tariff Act of 1930, is directed to investigate and report to the Senate all facts relating to wood pulp or pulpwood, showing the volume of importations compared with domestic production and the conditions, causes, and effects relating to foreign competition, and all other facts showing the differences in, or which affect competition between, the production of wood pulp or pulpwood in the United States or that imported in the principal markets of the United States. Such report to be made to the Senate not later than April 15, 1940."

Even if the pound is worth \$4.00 at the end of hostilities the currency advantages of the Scandinavian countries would be tremendous. We know that at a pound worth \$4.68, instead of par at \$4.86, their advantages ran from \$3.00 to \$4.00 per ton of pulp.

They would, if the krona, the finmark and the crown were tied to a \$4.00 pound, be able to force the shutting down of our pulp industry, throwing thousands of men out of work, making our pulpwood stands valueless, and turning our paper industry into a wild, price-cutting profitless mess.

A Program of Self Defense

• In the above outline of possiblities that might develop at war's end, no attempt is being made at prophecy. Nor is pessimism being emphasized. It is nothing more than an attempt to look at the future problems realistically.

The realistic viewpoint sees the urgent necessity of adopting a program of self defense for the American pulp and paper industry, for a great many industries for that matter.

We are, as a people, doing a large amount of talking about building up our defenses, our army, our navy and our air force. But little is heard about an equally vital arm of defense-Economic Defense. Against severely depreciated currencies even tariffs that were once considered high are of little or no value as defense bulwarks. The paper industry has felt well protected behind its tariffs, but were the Scandinavian countries' currencies tied to a British pound worth but \$4.00, we might well be flooded with all grades of sulphite and sulphate papers at prices we could not meet.

All American industry should ral-

ly around a program of economic defense to protect our people AF-TER the war in Europe. This economic defense differs from military defense in that it does no injury to the other side. In the matter of wood pulp imports measures of economic defense would not exclude foreign pulp. The foreign producers would be benefited by our self defense measures. Prices would be maintained, and they could sell on a basis profitable to them and to the American producers alike. No one would be injured; all would be protected.

An industrial self defense program should include:

- 1. Amending of the Anti-Dumping Act of 1921 to guarantee that protection to American industry which Congress intended but the act has not provided through inherent defects.
- Determination of dumping of foreign products should be based upon American costs of production, not upon foreign costs or foreign sale prices.
- Legislation which automatically offsets currency depreciation and maintains a relationship between the currencies of the various countries and that of the United States. This is a fundamental necessity for the future welfare of all American industries and of agriculture as well.

While it is not claimed that the above program, if put into operation, would prove a panacea for all our economic ills, it would go a long way toward stabilizing prices and maintaining American employment when the European war is ended.

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The Importance of the Borah Resolution

● The investigation of conditions existing on August 1, 1939, which the United States Senate directed the Tariff Commission to make, was aimed to produce the latest and most complete data on the pulpwood and wood pulp situation as the foundation upon which to build a program of self defense.

Instead of the war having eliminated the need for this investigation it has made it more imperative than ever, for we shall be faced with equally bad or even worse conditions upon its conclusion.

The Tariff Commission can help prepare to cushion the shock of the war's aftermath by furnishing the factual raw material for a program of self defense. Instead of taking advantage of this opportunity to serve American industry, the Commision takes the superficial, nearsighted view and says, "Preliminary inquiries indicate that the more conspicuous changes that have occurred since 1937 were the fall in the United States exports of wood pulp to Japan, substantial additions to pulp producing capacity in this country, a marked decline in pulp prices, and a generally depressed condition in the industry."

Any curbstone pulp or paper maker could have told the Senate that without costing the taxpayers a cent. Let's examine the several

". . . the fall in the United States exports of wood pulp to Japan . . ." That is a tough one. Japan has been waging a conflict in China and is short of foreign exchange with which to buy raw materials including pulp.

". . . substantial additions to pulp producing capacity in this country . . ." The way that is worded it sounds as if Americans had been breaking a law by building pulp mills and employing more of our own people instead of importing this pulp and allowing our forests to rot. If the price of imported pulp had been maintained through anti-dumping and depreciated currency legislation, the additions to the domestic industry would merely have replaced imports without the resultant price cutting by foreign producers.

"... marked decline in pulp prices..." It surely was "marked." From spot prices for bleached sulphite in 1937 which reached a high of around \$100 per ton and contract prices of \$70 per ton, the contract price of foreign bleached "declined" to around \$43 this past summer. What brought about this "decline" or debacle as some have dared to term it? That is a job belonging to the Tariff Commission but it "declined," too. Dumping and depreciated currencies plus low foreign wages and freight rates are the primary factors the Tariff Commission thinks unnecessary to record at present.

". . . and generally depressed conditions in the domestic industry . . ." They were definitely depressed, but why doesn't the Tariff Commission search out the factors causing this depressed condition so that we may adopt remedies in the light of full knowledge?

"At any rate the conditions pre-

vailing at the time the resolution was introduced do not now exist, and it seems unlikely that they will arise as long as the European war continues," says Chairman Stevens' letter.

But what about the conditions when the war ends? The Tariff Commission has missed the purpose of Senate Resolution No. 160. Whether it has been overlooked accidentally or purposefully we do not know, but we do believe that the Senate ought to demand that the Tariff Commission carry out its mandate in the interests of the American people.

And the Tariff Commission ought to be willing to do this job, for after all it obtains its funds through Congressional appropriations.

United States Tariff Commission Washington

PUBLIC INFORMATION

INVESTIGATION OF PRODUCTION AND IMPORTATION OF WOOD PULP

(Copy of the letter referred to in Congressional Record, Oct. 4, 1939, Page 219, as "a partial report . . .")

Oct. 2, 1939

The Honorable John Nance Garner President of the Senate.

In August of this year the Senate passed Resolution 160, directing the Tariff Commission to make a report on wood pulp and pulpwood by April 15, 1940.

Upon receipt of the resolution the Commission instituted an investigation designed to bring down to date the information contained in a comprehensive report on wood pulp and pulpwood submitted to the Senate in 1937. Preliminary inquiries indicate that the more conspicuous changes that have occurred since 1937 were the fall in the United States exports of wood pulp to Japan, substantial additions to pulp producing capacity in this country, a marked decline in pulp prices, and generally depressed conditions in the domestic industry. Before the work of obtaining and analyzing complete information on these and other developments was far advanced, the outbreak of the war in Europe led to disturbances of shipping from Sweden, Norway, Finland, and other European countries—countries which together in recent years have been supplying over two-thirds of the total imports of wood pulp into the United States. Freight and insurance charges on shipments from Europe have been sharply increased and there is much doubt as to what quantities of wood pulp can be delivered even at these increased charges. Under these circumstances the situation in wood pulp changed in the course of a few days from a buyers' to a sellers' market. Whether or not the conditions of the moment will continue, or be somewhat moderated, or be intensified during the remainder of the war period can not now be foreseen. At any rate, the conditions prevailing at the time of the resolution was introduced do not now exist, and it seems unlikely that they will arise as long as the European war continues.

In view of these circumstances, unless the Senate gives instructions to the contrary, the Commission proposes to withhold for the time being the completion of the report on wood pulp and pulpwood. We will, however, keep advised in regard to current conditions and report on them if at any time the situation seems to warrant such action.

Respectfully,
(signed) RAYMOND B. STEVENS,
Chairma

Soundview Modernizing Original Bleach Plant

 On September 18th the Soundview Pulp Company of Everett, Washington, began construction of six new bleach cells as an addition to the original bleach plant built in 1930. When the new cells are completed about the middle of December the original bleach plant will be equipped to produce the same qualities of bleached sulphite pulp as are now being made in the new bleach plant installed in 1937.

The new bleach plant employs the three stage batch cycle consisting of direct chlorination and two hypochlorite stages, and the original unit is being modernized to operate on

this same principle.

The cells are of the Pulp Bleaching Company design and the necessary equipment is being supplied by their Pacific Northwest representatives, the James Brinkley Company of Seattle. All equipment is being made on the Pacific Coast. The six gear drives are under construction by the Western Gear Works of Seattle, who will also manufacture the

For washing the chlorinated stock a 6x10 foot Oliver rubber covered washer has been ordered from Oliver United Filters, Inc., of Oakland, California.

The draft tubes, which will be of Douglas fir, are being manufactured by the National Tank & Pipe Company of Portland, Oregon. The changes in the bleach plant will necessitate the installation of four new stock pumps, and these are to be made by the Bingham Pump Company of Portland. Over 150 fittings will be rubber covered.

The five high density second stage cells and the eight low density cells are to be equipped with recording thermometers. After acid chlorina-tion the stock is washed and then neutralized with caustic soda. The amount of caustic added will be automatically regulated by pH controllers in order to obtain the correct pH of the stock.

E. G. Drew of Portland has been awarded orders for the first stage bleach washer hood, the exhaust system for the bleach plant, and for three ejector exhaust units for removing foul air from the chlorin-

The Austin Company of Seattle were awarded the contract for constructing the six new bleach cells and

the building in which they will be

The bleach cell linings will be installed by the Stebbins Engineering Corporation of Seattle.

In addition to the modernization of the original bleach plant Soundview is tile lining two stock chests and the machine pits of the original two pulp drying machines. This work is also being done by the Stebbins Engineering Corporation. The pits of the two drying machines installed in 1937, together with the stock chests put in at that time were tile lined upon installation.

Bellingham Pulp Mill Running at Top Speed

• The modern unbleached sulphite pulp mill of the Puget Sound Pulp & Timber Company at Bellingham, Washington, is now operating at the rate of 260 tons per day according to Ossian Anderson, president of the company.

Previously rated at 240 tons daily, the Bellingham mill was completed in June of 1938. Until the rush of orders from domestic converting mills as a result of the war in Europe, the new plant had not had the opportunity to show what it could do under full steam. Erik Ekholm is general superintendent of the Bellingham Division of the Puget Sound Pulp & Timber Company, and Walter De-Long is general manager.

Camas to Install Another Kraft Digester

• The Crown Zellerbach Corporation has ordered a new Babcock & Wilcox kraft digester for the Crown Willamette mill at Camas, Washington. This unit will increase kraft pulp production by about 15 tons per day.

The company has also purchased a second Stetson-Ross brouter to handle

two-foot wood in the wood room.

A second well is now being drilled as a means of supplementing the mill's supply of clear water. It is hoped to get a flow of 2,000 gallons per hour at a depth of 80 or 90 feet.

Camas and West Linn Making Sulphite for Sale

 Because of the increased demand for sulphite pulp, resident mill manager Clarence Bruner has again started up the pulp machines at the Crown Zellerbach mill at West Linn, Oregon, and is mak-ing pulp for outside sale. Some of it is being shipped to the company's mill at Lebanon. The Crown Willamette mill at Camas is also making additional sulphite pulp which is shipped to the National Paper Products Co. at Carthage,

Lebanon Enlarging One Digester

• The Crown Zellerbach Corporation is putting a five-foot band in one of the 15 by 35-foot digesters at their Lebanon, Oregon, mill, making it the same size as the 15 by 40-foot digester recently brought up from Floriston and installed in the new digester building.



SIX NEW BLEACH CELLS under construction by the SOUNDVIEW PULP COMPANY, Everett, Washington, as they appeared on October 5th / / A steel and brick building will be erected around the new cells and the five present cells showing in the picture, which are a part of the mill's original bleach plant.

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Everett Plans Extensive Modernization Program

The Everett Pulp & Paper Company will begin immediately a program of modernization which includes rebuilding and increasing the size of its bleach plant, the construction of a new screen room and the building of a new water filter plant.

• The Everett Pulp & Paper Company of Everett, Washington, manufacturers of book, writing and specialty papers since 1892, have begun an extensive program of modernization which will improve quality and expand the production of several departments. The announcement was made on October 12th by Anson B. Moody, assistant secretary.

A new bleach plant of concrete and brick will be constructed adjoining the present bleach department building, more than doubling the floor space. It will be equipped with a multiple stage system employ-ing three stages. The single stage bleaching system now in use will become the final stage and all of its equipment will be employed in the multiple stage system. Brown stock storage chests will be built along with intermediate cells and a new vacuum washer installed. Vacuum washers now in use will be rebuilt to modern specifications.

The bleach plant will be equipped with the latest recording and controlling instruments to assist in providing a bleached pulp of uniform qualities from the cottonwood and Douglas fir used by Everett in producing its various grades of papers.

A new screen room will be built and modern flat screens installed, more than doubling the present screening equipment of the mill. New deckers will be purchased to replace the present ones.

Additional water requirements will be met by expansion of the gravity filter plant from its present capacity of approximately 7,000,000 gallons daily to over 9,000,000 gallons. The new filter unit to be constructed will have 3,000,000 gallons per day capaity and will replace one old unit of 1,000,000 gallons capacity.

The Cover Photograph

was taken by Fred R. Armbruster, as-sistant sulphite superintendent for the Powell River Company, Ltd., Powell River, B. C., and is published through his courtesy.

He is the son of G. J. Armbruster, general superintendent of the Soundview Pulp Company, Everett, Washington.

At the time of going to press contracts for equipment and construction had not been let but the work will be well under way before the end of October. Although no date for completion of the program has been determined as yet the work will be pushed without delay.

Everett's modernization program is the result of a long period of study and investigation by executives to determine the best means of further improving the large variety of papers produced by the company. These include a broad line of book papers, label and lithographic papers, offset papers, writing papers, mimeograph papers and tablets and stationery.

President of the Everett Pulp & Paper Company is A. H. B. Jordan. W. J. Pilz is vice-president and manager, Anson B. Moody, assistant secretary; and L. Paul Fortier, general superintendent.

CZ Men Back From Wisconsin Trip

• Albert Bankus, Crown Zellerbach vice-president; William R. Barber, research director for the corporation, and H. E. "Heinie" Ostenson, Crown Willamette paper mill superintendent at Camas, returned to the Coast the latter part of last month after visiting mills in Wisconsin.

B. C. Pulp Running Full

Because its operations are almost entirely on a contract basis, B. C. Pulp & Paper Company has not yet felt the re-

Paper Company has not yet felt the result of general price improvement in the bleached sulphite market.

However, the company has its two mills operating at capacity at Woodfibre and Port Ailce, compared with about 50 per cent or less, which was the prevailing rate for the past year.

Ordinarily prices are fixed on contracts

Ordinarily prices are fixed on contracts subject to adjustment every six months, and it is expected that the next revision will be some time in December, to cover the first half of 1940. Owing to war and uncertainties, the price set then may apply for a briefer period than six months.

Most of the B. C. Pulp & Paper Company's business is with the United States, the British Isles and Japan.

CZ Men to Meet In Olympia

• The annual meeting of the Crown Zellerbach Technical and Superintendents Association will be held in the Olympian Hotel, Olympia, Wash., on October 27 and 28.

Paper Instead of Bombs

Up to the time of going to press British planes had dropped on German soil nearly thirty tons of paper in the form of leaflets outlining Britain's position in the war and emphasizing that Britain and France were fighting Hitler and not the German people.

Anacortes Pulp Mill Resumes Operation

• The Anacortes Division of the Puget Sound Pulp & Timber Company resumed operations on October 5th after having been shut down since December, 1937.

Production of unbleached sulphite pulp is now at the rate of 85 tons per day, according to Ossian Anderson, president of the company, and approximately 80 men have been put back to work.

Under the direction of James P.

V. Fagan, manager of the Anacortes Division, a large crew of men began on September 18th the work of putting the mill in shape for operation. Equipment had been kept in good condition during the shutdown, wood tanks and pipe were filled with water to prevent drying out and metal parts were covered with rust pre-

The Anacortes Division will operate at maximum capacity for an indefinite period.

TAPPI Holds First Dinner Meeting in Seattle

N. W. Coster reelected Chairman of the Pacific Section—Group hears papers on "Fundamentals of Wage Determination" and on "Proper and Safe Handling of Liquid Chlorine and Caustic Soda in Tank Cars," at the first dinner meeting of the 1939-1940 series, held at the Hotel Edmond Meany in Seattle on October 3rd.

• The first of the 1939-1940 series of dinner meetings sponsored by the Pacific Section of TAPPI was held on Tuesday evening, October 3rd at the Hotel Meany in Seattle.

The first order of business was the election of a chairman who is to serve until next August or September when the Fall Meeting of National TAPPI will be held in Seattle. The nominating committee did not present a candidate for chairman of the section at the joint meeting of the superintendents at Tacoma in June but held its report for the first Fall dinner meeting.

Vice-chairman Fred A. Olmsted gave the committee's report, nominating N. W. Coster for re-election as chairman of the Pacific Section. The committee's nomination was unanimous and the vote of the members at the meeting on October. 3rd was likewise unanimous. Mr. Coster, who is technical director of the Soundview Pulp Company of Everett, is experienced in administrating the affairs of the Pacific Section, having served as chairman during 1938-1939 and as vice-chairman in charge of programs in 1937-1938.

Mr Coster expressed his appreciation of the honor of re-election as chairman, saying that he would give the section his best efforts during the coming year. He reported that the Pacific Section was officially represented at the Fall Meeting in Syracuse, New York, September 12-14th, by G. S. Brazeau, a member of the national executive committee and manager of the Everett mill, Pulp Division, Weyerhaeuser Company. An exhibit at the Syracuse meeting, Mr. Coster said, invited all members of TAPPI to come to Seattle next year to attend the meeting here.

J. M. Tedford, job analyst of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, presented the first paper, "Fundamentals of Wage Determination." Mr. Tedford's paper is published in this issue. Considerable discussion followed the paper.

The second paper was presented by Brian Shera, service engineer of the Pennsylvania Salt Manufacturing Company of Washington, Tacoma. Mr. Shera spoke on "Proper and Safe Handling of Liquid Chlorine and Caustic Soda in Tank Cars." His paper was followed by a period of discussion. It is published in this number.

In the name of the section Mr. Coster welcomed back to the meeting J. V. B. Cox, superintendent of the Paper Makers' Chemical Division of Hercules Powder Company, Portland. Mr. Cox, whose health caused him to resign the office of secretary-treasurer a year ago, is back at work, having fully recovered.

Mr. Coster introduced Dr. Alan J. Bailey, who was recently appointed assistant professor of chemistry and acting director of cellulose and lignin research at the University of Washington. Dr. Bailey received his degrees from Washington has spent the last four years in the middle west, one year at the Institute of Paper Chemistry in Appleton, Wisconsin, and three years as assistant professor of forestry at the University of Minnesota, where half his time was devoted to research on cellulose and lignin. At Washington Dr. Bailey will devote his entire time



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N. W. COSTER Reelected Chairman of the Pacific Section of TAPPI

to pure research on lignin and cellulose.

The next TAPPI dinner meeting will be held in Camas, Washington, on Tuesday evening, November 7th, and Fred A. Olmsted, vice-chairman of TAPPI and technical supervisor of the Crown Willamette Paper

The November TAPPI Dinner Will Be at Camas

The November Dinner Meeting sponsored by the Pacific Section of TAPPI will be held at Camas, Washington, on Tuesday evening, November 7th at 6:30 p.m.

On the program will be a talk by W. W. Offner of Seattle on "X-Ray Examination of Equipment," illustrated by slides and a portable X-ray machine.

Harry G. Specht, vice-president and general manager of the Eastwood-Nealley Corporation of Belleville, N. J., will speak on "Paper Machine Wires."

"Packaging, a Public Service," is the title of a sound film on the subject of modern packaging's contribution to everyday life, which will be shown at Camas.

Reservations for the Camas Dinner Meeting should be sent to FRED A. OLMSTED, Vice-Chairman, Pacific Section of TAPPI in care of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Wash.

Company's Camas mill, will serve as chairman in charge of arrangements.

Mr. Olmsted has announced the following program for the Novem-

ber 7th dinner meeting:

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airperiper W. W. Offner of the Industrial X-Ray Company of Seattle, will present a paper on "X-Ray Examination of Equipment." His talk will be illustrated with slides and he will have a small X-Ray machine at the meeting to demonstrate how internal damage to installed equipment may be determined.

Harry G. Specht, vice-president and general manager of the Eastwood-Nealley Corporation of Belleville, N. J., will speak on "Paper

Machine Wires."

A sound film, "Packaging, A Public Service," will be presented at the Camas meeting. This picture shows the value of modern packaging, particularly of foods, to the life of the average man.

The officers of the Pacific Section for 1939-1940 are: N. W. Coster, chairman; Fred A. Olmsted, vice-chairman; Fred C. Shaneman, secretary-treasurer; and Dr. H. V. Tartar and George H. McGregor, members of the executive committee.

Following are the name of those who attended the Seattle dinner meeting:

Gerald Alcorn, Pulp Division, Weyerhauser Timber Co., Everett; A. J. Bailey, Department of Chemistry, University of Washington, Seattle; D. Barl Baker, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend; John H. Baker, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; Walter R. Bauman, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; Iver E. Belsvig, St. Regis Kraft Co., Tacoma; Charles H. Belvin, Jr., Chromium Corporation of America, Portland; Dr. H. K. Benson, Department of Chemistry, University of Washington, Seattle;

Claire Bowman, Pacific Telephone & Telegraph Co., Seattle; A. M. Buck, Pulp Division, Weyerhaeuser Timber Co., Everett; Richard S. Buckley, Pulp Division, Weyerhaeuser Timber Co., Everett; A. M. Cadigan, St. Regis Kraft Co., Tacoma; John M. Carlson, Soundview Pulp Co., Everett; Kenneth Chapman, Pulp Division, Weyerhaeuser Timber Co., Everett; R. E. Chase, R. E. Chase & Co., Tacoma; N. W. Coster, Soundview Pulp Co., Everett; J. V. B. Cox, Hercules Powder Co., Portland; E. F. Drake, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend;

H. H. Evans, St. Regis Kraft Co., Tacoma; Irving R. Gard, Merrick Scale Mfg. Co., Seat-de; N. O. Galteland, St. Regis Kraft Co., Tacoma; A. S. Gerry, Pulo Division, Weyerhauser Timber Co., Everett; William R. Gibson, Northwest Filter Co., Seattle; Bror L. Grondal, College of Forestry, University of Washington, Seattle; D. Hamilton, Pulp Division, Weyerhauser Timber Co., Everett; S. H. Harrison, Westinghouse Electric & Mfg. Co., Seattle; R. S. Hatch, Pulp Division, Weyerhauser Timber Co., Longwiew; Walter S. Hodges, Appleton Wire Works, Inc., Portland; Albert H. Hooker, Jr., Hooker Electrochemical Co., Tacoma; W. F. Hynes, St. Regis Kraft Co., Tacoma; Carl R. Koch, Westinghouse Electric & Mfg. Co., Seattle;

Robert M. Kuhn, St. Regis Kraft Co., Taoma; Fairman B. Lee, Mechanical & Electrical
Products Co., Seattle; A. H. Lundberg, Seattle;
N. L. Mammen, Crown Zellerbach Corp., Portland; Robert W. Martig, Brown Instrument Co.,
Portland; George Millard, Chemical Engineer,
Seattle; T. E. Moffitt, Hooker Electrochemical
Co., Tacoma; Fred Nicholson, Stetson Ross
Machine Co., Seattle; E. A. Norton, Pulp Division, Weyerhaeuser Timber Co., Everett; Walter W. Offner, Industrial X-Ray Co., Seattle;

F. A. Ofmsted, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; Frederick M. Pape, Wilson & Geo. Meyer & Co., Seattle; Paul Pittenger, Pulp Division, Weyerhaeuser Timber Co., Everett; Carl A. Rehnberg, Northwest Filter Co., Seattle; Rav Le Riche, Brown Instrument Co., Seattle; Rav Le Riche, Brown Instrument Co., Seattle; Robinson, General Electric Co., Seattle; Fred C. Shaneman, Pennsylvania Salt Mfg. Co. of Wash., Tacoma; Harlan Scott, Pacific Pulu & Paper Industry, Seattle; Brian Shera, Pennsylvania Salt Mfg. Co. of Wash., Tacoma; H. N. Simpson, National Paper Products Co., Division of Crown Zellerbach Corp., Port Townsend;

Lawrence K. Smith, Pacific Pulp & Paper Industry, Seattle: J. D. Sullivan, Crown Zellerbach Corp., Seattle: P. E. Sullivan, Ingersoll Rand Co., Seattle: H. V. Tartar, University of Washington, Seattle: J. M. Tedford, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camss; V. L. Tipka, Hawley Pulp & Paper Co., Oregon City; R. O. Vognild, Hooker Electrochemical Co., Tacoma; Harold F. Warren, R. E. Chase & Co., Tacoma; Edward C. Wood, Pulp Division, Weyerhaeuser Timber Co. Longview.

Pacific Straw Running Full

● The Longview, Washington, plant of the Pacific Straw Paper & Board Co. is running full, seven days a week, according to mill manager and vice-president Arthur E. Zimmerman. Orders are holding up well, and while prices are still about the same, an increase is expected soon.

Litigation in which the company is involved, following the death of former president Charles Schaub, has not yet come to trial, but should come before the court about the last of this month.

British Confiscate Pulp Intended for Germany

• "Among the vast quantity of goods intended for Germany which has been confiscated as contraband by the admiralty there was included 7,300 tons of wood pulp," says The World's Paper Trade Review for September 22nd. This journal is published in London.

Vancouver Kraft Company, Ltd. Is Being Dissolved

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• The Columbia River Paper Mills has notified holders of obligations of California-Oregon Paper Mills and its successor, Columbia River Paper Mills, that the reorganization plan of Vancouver Kraft Company, Ltd., under which the obligations were issued, has been completed.

pleted.

Under the plan, Vancouver Kraft Co., Ltd., is being dissolved. Its stock is shown to have no value, equity in the company now being represented by obligations of California-Oregon Paper Mills, and the Columbia River Paper Mills, successor. Holders of these obligations are urged in the letter from F. W. Leadbetter, president of Columbia River Paper Mills, to forward their securities to the Title & Trust Company, Portland, Oregon, in order that securities of Vancouver Kraft Corporation, Ltd., a new company, may be forwarded from registered offices in British Columbia.

Under the reorganization plan, securi-

Under the reorganization plan, securities now available for exchange will lapse one year from the October 2, 1939, date

of notification.

Spaulding Operating At Maximum

• Improved volume of orders has enabled the Spaulding Pulp & Paper Co., Newberg, Oregon, to step up the plant to full production. The mill operated at capacity during September, and will continue on that basis at least until the first of the year. Contemplated reorganization plans are being held in abeyance for the present.

"Buff" Natwick Ill At Home

 A. G. "Buff" Natwick, assistant manager of the Crown Willamette mill at Camas, has been ill for several weeks, and it may be some time longer before he returns to his desk.



Before the TAPPI Dinner Meeting in Seattle on October 3rd a number of technical men visited Bagley Hall, the modern and well equipped headquarters of the Department of Chemistry and Chemical Engineering at the University of Washington.

In the above picture, left to right, Dr. H. K. BENSON, Executive Officer of the Department of Chemistry and Chemical Engineering; FRED A. OLMSTED, Technical Supervisor, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington; and R. S. HATCH, Research Director of the Weyerhaeuser Timber Company, Longview, Washington

Participating in the conversation but outside the range of the camera were Dr. H. V. TARTAR, professor of chemistry, and Dr. A. J. BAILEY, newly appointed assistant professor of chemistry and Acting Director of Cellulose and Lignin Research.

Fundamentals of Wage Determination

by J. M. TEDFORD*

Introduction

HREE years ago a press release appeared in New York regarding the revision of wage rate schedules. Our own Classification Committee of the Pacific Coast Pulp and Paper Manufacturers' Association regarded this statement of the National Conference Board to be of sufficient importance to distribute the releases to all the members of the association. Even though three years have elapsed since its appearance it is none the less true.

"New York - Revision of wage rate schedules on a sound, equitable and scientific basis is being undertaken by an increasing number of progressive companies, according to a survey of the National Industrial

Conference Board.

"Serious consideration of the economic and social soundness of wage scales, the Board points out, did not end with the code-making period of the N. R. A. Actually, it only got well under way at that time. Whether the minimum rates, as established, worked out satisfactorily or not, the question of the defensibility of particular rates had been so definitely raised that industrial executives began to study this question on a broader scale than ever before.

"Most wage rate structures, the report continues, are the hit-and-miss result of a multitude of conflicting factors and influences. Individual rates, for the most part, have been the products of a series of 'Push and Pull' forces which have carried some upward and some downward. Conformity to any reasonable or precise standard has usually been attained more by accident than by design.

"The current thorough overhaulings of wage-rate schedules being undertaken by a number of outstanding companies represent progressive and constructive industrial relations policy, the Board concludes. Through such revisions, the whole subject of compensation, the most fruitful and persistent source of grievances and hard feelings is

In presenting his paper Mr. Tedford said: "It should be made clear at the outset that this discussion does not involve labor measurement which results in premium or bonus plans. The program discussed here is approached from an entirely impersonal standpoint. It is only concerned with the evaluaton of the job and not the measurement of the effectiveness of the individual who handles the job. In other words, it is a job appraisal plan and not a production measurement or personnel evaluation plan."

being placed on a cooperative, uniform and objective basis." This is the end of the quotation.

I present this long quotation to you because it heralds the advent of a new era in industrial relations. It states the problem which is before us involving the new economic and social soundness of wage scales and suggests to us that the scientific approach is the one for us to pursue.

It should be made clear at the outset that this discussion does not involve labor measurement which results in premium or bonus plans. The program discussed here is approached from an entirely imper-sonal standpoint. It is only concerned with the evaluation of the job and not the measurement of the effectiveness of the individual who handles the job. In other words, it is a job appraisal plan and not a production measurement or personal evaluating plan.

Causes of Labor Disturbances

- There are many causes of labor disturbances which very much concern industry and society, but they can be grouped under four classi-
 - 1. Unsatisfactory Wage Levels.
 - 2. Haphazard Wage Structures.
 - 3. Working Conditions.
 - 4. Jurisdictional Disputes.

These four causes are somewhat interrelated, yet each stands out in conflict to harmonious relations between worker and employer.

The first cause, Unsatisfactory Wage Levels, presents a problem of negotiation, which of course should be based on an exhaustive study by both management and labor to determine an equitable level for which to negotiate.

There are well established rules by which we can measure our wage level in its relation to the wage level in the area. For purposes of this discussion, wage-level should have a broad significance and should cover the whole structure pictured by the spread between the minimum rates for common labor and a reliable measure of prevailing values for

skilled labor, within a given area. The second and third causes: Haphazard Wage Structures, and Working Conditions, present problems which must be faced at one and the same time, for the solution of the wage structure problem involves a study of working conditions. Jurisdictional Disputes, the third cause mentioned, is hardly one for us to analyze completely; it represents a problem which can only be disposed of by education in the art of applying the Golden Rule.

This problem has been under development for two thousand years; and while there still remains a hope of its solution, there also remains the apparent necessity for the discipline of those who persist in looking out of the window while the rule

is being taught.

Proper Wage Structure Characteristics

 In order to visualize our presentday wage structure, we have but to mention the characteristics of the ideal, and immediately the haphazard scale appears before us. The characteristics of an improved, if not an ideal, wage structure are given as follows:

A. A common basic wage-level for all "steady-work" industries and

*Member of the staff of Crown Zellerbach Corporation. Mr. Tedford represented the Pacific Coast Pulp & Paper Manufacturers Association in the development of the job analysia, a large part of which was done in cooperation with the two brotherhoods, the International Brotherhood of Paper Makers and the International Brotherhood of Pulp, Sulphite & Paper Mill Workers.

Presented at the Dinner Meeting sponsored by the Pacific Section of TAPPI and held at the Hotel Edmond Meany, Seattle, Washington. on October 3, 1939.

trades in a given area, which is high enough to permit a decent standard of living.

B. To build a consistent wage structure upon a basis wage level it is necessary to recognize a second anchorage point which will indicate the value of certain degrees of skill and responsibility beyond the requirements of base rate jobs. The rate for a Class A journeyman maintenance mechanic, a job found in almost every mechanized industry, furnishes the most reliable second anchorage point. The difference between the generally prevalent rates for common labor and such "main-tenance mechanic" jobs then be-comes the accepted value of the special requirements of the mechanic job, over the requirements of common labor.

C. A method of determining, for every job, the kind and amount of special requirements, under skills, working conditions and responsibilities, which distinguish such job from a "base-rate" job.

D. A schedule of advancement with the absolute minimum of "deadend" jobs, not scheduled as to time for advancement but as to position in line of promotion.

Characteristics Described

A. Proper Basic Wage Level.

The most desirable wage-level is one which is high enough to permit a decent standard of living, being higher for "intermittent" than for "steady work" industries and trades. The present prevailing wage levels reflect these differences, accounting for the generally higher rates paid to construction trades mechanics than to industrial maintenance mechanics.

The most peaceful situation involving workmen and employers should exist where the wage-levels recognizse the final importance of annual earnings. This means a higher wage-level for "intermittent work" employment than for "steady work" employment. A common wage-level for all "steady work" industries within a common area would seem to promote the best relations. Certainly, any industry which has established its own common wage-level as a base upon which to build a wage structure is less subject to inter-plant controversy.

Normally, wage-levels in the "intermittent" and "steady" employments find their proper relationship in a competitive labor market. When choices between employments are possible, men weigh the privileges of "intermittent" work against the advantages of "steady" pay and thus set up differentials between wage levels which are fundamentally sound.

Each "intermittent-work" industry or trade such as construction trades mechanics should establish its own wage-level, first with relation to the "steady-work" industry wage-level, and second, with relation to its experience in continuity of employment. In other words, the basic rate for all work within an area should be the same until the intermittent feature is evaluated and added. To cite an example: an industrial machinist's job might be evaluated at ninety cents per hour, whereas similar work subjected to partial employment may pay ten, twenty or even fifty per cent more, depending upon the steadiness of employment.

Probably the greatest stride in the direction of a common labor wage-level for a single industry has been taken by the Pacific Coast Pulp and Paper Industry where a uniform base has been acceptable by labor and management in the thirty-four coast mills. In doing so they have recognized this feature as an agency for industrial peace.

B. Consistent Wage Structure.

Every industry has its own individualities or features which are peculiar to itself. However, every mechanized industry employs trades maintenance mechanics whose jobs are basically uniform, only differing in minor characteristics. A journeyman carpenter, for example, can perform maintenance work in any industry equally well. And since all rates are influenced by the trades, the rates paid for industrial maintenance mechanics jobs serve as a guide to values for skilled work. It is necessary in platting a trend to locate an anchorage point above base, between which values for semiskilled work will fall. Such anchorage point also gives direction to the continuation of a trend which reflects responsibilities beyond those normally assumed by mechanics.

The location of this anchorage point gives the money value above base which when divided by an indicated number of intervals determines the value of the Step. A careful examination of the elements which constitute the difference in value between the job of an "A" mechanic and that of a common laborer leads to the conclusion that the difference represents 12 of the units adopted for expressing the dif-

ferences between jobs, in other words, 12 Steps.

In the situation which exists at the present time, in the Pacific Coast Pulp and Paper industry, the basic wage is \$0.625 and the journeyman mechancis's rate is \$0.925. The difference of 30c when divided by 12, gives a value for each step of \$0.025. This step value will then, of course, vary with an increase or decrease in the spread between the base wage and the rate of a journeyman mechanic.

Attention should be called to the fact that the \$0.025 bracket is convenient, in that it is small enough to provide as accurate a measurement as is humanly possible and large enough to provide an attractive gain in line of promotion. In a 40-hour, 50-week year, the \$0.025 Step means \$50.00 per year.

C. Standard Evaluation of Factors

The various skills, working conditions and responsibilities, have definite values as indicated in an analysis of the prevailing wage structures. When we dissect the prevailing wage scales to weigh their elements, we find that the elements can be fitted into new scales, thus creating a new structure which has been semi-scientifically formed. Just as a tree is taken apart by mechanical and chemical processes and reformed into a sheet of paper, so the old wage structure can be taken apart and reconstructed into a new wage structure. And where this new wage structure has been applied it has had the general approval of both labor and management.

The factors which make any job worth more than wage-level are here



J. M. TEDFORD, Spoke on Evaluation of Jobs.

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are l for a n d indicated. Any plan which tries to evaluate work by the method of job appraisal does not change these factors or add new ones. Such a plan only tries to set up standard ways of valuing each factor.

Factors Listed

SKILL

(Synonymous with Dexterity, Versatility, Precision and Coordination. It is the product or indication of the presence of the following factors 1 to 4.)

- 1. Education (School Training)
- 2. Experience (Job Training)
- 3. Judgment (Includes Initiative and Ingenuity)
- 4. Physical Ability (Fitness)

WORKING CONDITIONS

Hazards, Discomforts and Personal Expense

RESPONSIBILITY FOR

- 6. Equipment (Its protection against repair costs)
- 7. Material (Its protection against Loss, Degrading, Curtailing and Delay)
- 8. Personnel (Regard for performance, progress and safety of other employees)

Factors Described

Skill

The term skill is synonymous with dexterity, versatility, precision and coordination, and all develop from, or are indications of the presence of the first four factors listed above; Education, Experience, Judgment, and Physical Ability.

These four factors are sometimes thought to be synonymous with skill but for purposes of evaluating skills it is more correct to think of skill as being a product of the factors named, or as an indication of their

presence.

The standard evaluation of each factor develops from the recognition of values which have been placed upon them in the past and which bear reasonably close similarity between industries within a region. For example, in a given region, jobs requiring an equivalent education, pay approximately the same wage, assuming of course that all other factors are equal. The same can be said for the other factors, Experience, Judgment and Physical Ability. The time required to obtain these skills seems to be the dominant influence in their establishment.

Judgment and Physical Ability can be partly acquired in much the same way as the time consuming factors, Education and Experience, but are considered also to be an indication of inherent skills, the measure of which is not in terms of the time spent in acquiring them but in terms of their relative importance among many jobs within the prevailing wage structure.

Each of the skill factors mentioned are measured in terms of a common unit, the Step, which in this region and in this industry is worth \$0.025. Variable features, such as the number of units operated, speeds, grades, etc., determine the dimension of the credit tables, for such features create the complexities.

Working Conditions

Working conditions to which men are exposed vary widely between industries and jobs. They vary from the normal hazards and discomforts for which no credits are allowed, to life hazards and severe discomforts for which equitable allowances are made. Normal hazards and discomforts compare with those to which men are exposed off the job or on any average job. For example, credit for the heat discomfort only compensates for the heat condition which is seriously beyond the normal heat to which everyone in the community is exposed. Each working condition factor, like the skills described above, has a fairly definite value in the prevailing wage structure which can be established quite satisfactorily. Differentials between base and the rate paid for certain jobs are caused only by a recognition of the severity and frequency of exposures to hazards and discom-

Working conditions dominate attitudes many times, and a willingness to submit to certain conditions may be just as great a factor in supplying good workmen as are the skills required. Little difficulty has been experienced in recent years in supplying workmen for any jobs regardless of working conditions, but the attitudes toward hazards and discomforts persist never-the-less and must be provided for in the wage structure, if the highest efficiencies are attained.

Credit tables have been developed for hazards and discomforts by types according to severity and frequency of exposure. These tables, like all others, express values in terms of Steps. Credits have been related by much investigation, jointly and otherwise, so that credits by hazard and discomfort types bear a reasonable relationship to each other and to credits for skills and responsibilities.

Responsibility

A workman may possess sufficient skill and be willing to submit to any kind of working conditions, yet may not be willing or able to assume the responsibilities imposed. A willingness and ability to assume responsibility for good performance may be just as scarce as the skill required for good performance and because these qualifications are scarce they have value.

It is therefore necessary, in the establishment of a wage structure. to evaluate job responsibility. There are three distinct types of responsibility which lend themselves to measurement; they are, Responsibility for Equipment, Responsibility for Material, and Responsibility for Personnel. Each is set out as a separate fcator in order to simplify its measurement. Responsibilities normally have a tendency to follow skill but since their relationship follow no distinct pattern it is necessary to treat them independently. The indication of the extent of responsibility must be expressed in credit tables constructed with job features as di-

Equipment Responsibility has two dimensions; value of equipment and loss probability. The higher the equipment value, all other things being equal, the greater the responsibility. Also, the greater the probability that equipment repairs will be necessary, the greater the responsibility. A table of factor values, expressed in Steps, covering a wide range of equipment values and loss probabilities has been developed which provides credit for any set of conditions.

Material Responsibility has three dimensions; value of material processed by an individual per hour, the possibility that losses can occur, and the probabilities that losses will occur. The highest material values, subjected to the greatest loss possibilities and probabilities indicate the highest material responsibilities.

Personnel Responsibility has two dimensions, the number of persons supervised and protected, and the degree of complexity encountered in discharging that responsibility, which we call "loss probability." The larger the crew and the greater the intensity of supervision, the greater the responsibility. This factor is also represented by a table of values, expressed in Steps which covers a wide range of personnel and loss probabilities. It provides credit for any set of features and conditions.

D. Program of Advancement

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A program of advancement is sometimes more important to the workman than the amount of his immediate wage. Ambition is a most desirable qualification and yet industry often loses the opportunity to profit by ambition, by failing to open a line of promotion for persons who are capable and willing to progress and improve.

While this is not usually considered to be a part of the program of wage determination, it is one which has to do with satisfaction by fair treatment, just as truly as do the wages paid.

A program of advancement must

be promoted on the basis of ability as the first consideration. A workman has a right to know, if at all possible, where he is headed, if he makes good.

Summary

To summarize: the intelligent wage plan should be based upon the following:

- 1. A definite wage level which reflects continuity of employment.
- 2. An upward trend for skilled work, dependent for its direction upon the proper evaluation of skills, working conditions and responsibilities, but guided and anchored to the current base wage-level and to current wage levels for journeymen

maintenance mechanics, which types are common to all industry.

3. A program of advancement which incites ambition.

It is not too much to look forward to the establishment of wage structures which bear those characteristics because many of the obstacles have been overcome in the development by research of the principles stated. Our own program in the pulp and paper industry here on the Pacific Coast bears these characteristics. Enough applications have been made, to the satisfaction of both labor and management, that we may feel confident of continued satisfaction under a broader pro-

Superintendents Plan December Meeting

Semi-annual meeting of Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association will be held in Portland, Oregon, on December 1st and 2nd—Four members will present papers.

• E. W. G. Cooper, chairman of the Pacific Coast Division of the American Pulp & Paper Mill Superintendents Association, has announced the decision of the Executive Committee to hold the next semiannual meeting in Portland, Oregon, on Friday and Saturday, December 1st and 2nd.

On Friday afternoon, December 1st, the Executive Committee is scheduling conducted tours of pulp and paper mills at Camas and Vancouver, Washington, and at West Linn and Oregon City, Oregon.

In the evening the superintendents will hold an informal party. The business meetings will open with a session on Saturday morning, December 2nd. Four papers will be presented by mill operators. Anton Siebers, vice-chairman, is arranging for the papers in cooperation with Mr. Cooper.

Following luncheon on Saturday the superintendents will hear a report by Mr. Siebers who attended the national meeting held in Washington, D. C., last June as the Pacific Coast Division's official delegate. Officers will be elected to serve during 1940.

In the afternoon the Round Table

Discussion, which is always a major feature of the superintendents' meetings, will be staged with Mr. Cooper and Mr. Siebers in charge.

Want Questions

• Questions concerning operating problems and equipment are wanted in advance of the meeting in order that a comprehensive and practical program may be planned for the Round Table Discussion. Questions may be sent to E. W. G. Cooper, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation at Camas, Washington, or to Anton Siebers, Longview Fibre Company, Longview, Washington.

The questions need not be signed as no names or mill connections will be used in bringing them before the Round Table.

On Saturday evening a dinner dance will conclude the meeting.

Details of the program, including the place of the meeting in Portland and the titles of the papers will be announced in the November issue.

New Members

According to Secretary-Treasurer
 A. S. Quinn, the Pacific Coast Di-

vision is now the second largest regional division of the American Pulp & Paper Mill Superintendents Association, being exceeded in the number of members by only one other, the New York-Canadian Division.

Since the last meeting in June a number of new members have joined the Pacific Coast Division. They are: Alexander V. Alm of the California Fruit Wrapping Mills at Pomona, California; George H. Colson, Pacific Mills, Ltd., Ocean Falls, B. C.; Joseph P. Foley, Hawley Pulp & Paper Company, Oregon City, Ore.; Anton Gustin, Grays Harbor Division, Rayonier Incorporated, Hoquiam, Wash.; Elmer E. Logsdon, Hawley Pulp & Paper Company, Oregon City, Ore.; J. F. Smalley, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Wash.; Mitchell W. Thom, Sidney Roofing: & Paper Company, Victoria, B. C.; Alfred R. Webb, Pacific Mills, Ltd., Vancouver, B. C.; John F. Weiblen, Grays Harbor Division, Rayonier Incorporated, Hoquiam, Washington; and, Loring R. Wood of the same organization.

University of Washington to Expand Research on Lignin

Dr. A. J. Bailey joins the University's staff and will devote his entire time to research in the field of chemistry of lignin and the constituents of wood related to it.

On October 1st Dr. Alan J. Bailey assumed his new duties as assistant professor of chemistry and acting director of cellulose and lignin research at the Unievrsity of Washington, according to an announcement by Dr. Henry K. Ben son, executive officer of the Department of Chemistry and Chemi-

cal Engineering.

Dr. Bailey is returning to his alma mater after an absence of over three years. He obtained his three degrees from the University of Washington, Batchelor of Science in Forestry in 1933; Master of Science in Forsetry in 1934 and Doctor of Philosophy in Forestry in 1936. Although his degrees were all taken in the College of Forestry, much of Dr. Bailey's scholastic work was done in the Department of Chemistry and Chemical Engineering.

His thesis for his master's degree was "Lignin in Douglas Fir," and for his doctor's degree, "The Distribution of Lignin in Wood."

From March, 1936, until December of the same year Dr. Bailey taught and carried on research work at the Institute of Paper Chemistry in Appleton, Wisconsin. He left there to accept a position as assitant professor of forestry at



Dr. A. J. BAILEY, appointed Assistant Professor of Chemistry and Acting Di-rector of Cellulose and Lignin Re-search at the University of Washington.

the University of Minnesota where half of his time was devoted to teaching and half to research. He resigned from the University of Minnestota staff to accept the new position at Washington.

Dr. Bailey has published numerous papers covering his research work on wood, cellulose and lignin.

 For some years the University of Washington has been interested in pure research dealing with cellulose and lignin. Professor Bror L. Grondal in the College of Forestry has been especially concerned with lignin in the cell wall and its relation to cellulose.

In the Department of Chemistry and Chemical Engineering, Dr. Henry K. Benson, with his graduate and undergraduate students, have been interested in lignin as a constitutent of sulphite waste liquor and numerous publications have appeared as a result of these researches over a period of the past ten years.

It is now proposed to investigate more intensively into the chemistry of lignin to study its physical and chemical properties. For this purpose the University of Washington is planning to broaden its interest in such research through the addition of properly qualified research workers to the staff.

The first addition for this purpose is Dr. Bailey, who will give his entire time to research in the field of chemistry of lignin and the constituents of wood related to it.

Through the inauguration of this research the University of Washington recognizes the need of rendering service to the forest as a raw material for industry. Through the University's various departments of science such problems as the location of lignin, the origin of lignin in plant life, the chemical structure of lignin, the relation of micro organisms to the components of wood, will ultimately bring into play the research activities of forestry, chemistry, botany and bacteriology.

With these scientific forces converging upon wood as a raw material for scientific study," stated Dr. Benson, "it is obvious a much broader base for its use in industry

will be laid."

Port Mellon **May Resume Operations**

 If kraft prices continue to rise, a new chapter may be written in the up-and-down story of Port Mellon Operating Company on Howe Sound. Interests financially involved in this organization, which had a short lease of operating life in 1937, are now considering the feasibility of re-opening the mill.

Litigation surrounding the company has now been pretty well cleared up, and once the management considers th ket situation justifies production there is nothing serious to prevent an early re-The sawmill which forms a part opening. of the plant has been operated continuously for the past year by Rounds-Burchett Lumber Company.

Port Mellon Operating Company ori-ginally had contracts with Japanese inter-ests for all the kraft it could produce, but this business was killed when the Sino-Japanese war prevented the issuance of

credits.

Recently, the Canadian kraft industry has been handicapped to some extent by competition from the United States. The competition from the United States. The American industry, especially in the southern states, expanded to such an extent in the last few years that there was considerable surplus available for dumping, some of it going to Canada.

The war situation, however, has altered the kraft picture. Prices have already climbed \$10 a ton in some sections. The reaction of warring domands has diverted.

creation of wartime demands has diverted the interest of American kraft manufacturers to their own and more profitable market. Domestic demand in Canada is

continually growing.

Bob Young Visits States

 Robert Young, assistant mill manager of Pacific Mills, Ltd., at Ocean Falls, B. C., spent two weeks in Portland the latter part of September. Mrs. Young accompanied him

MacMillan Expects Pulp Expansion

 Pulp and paper production is one of the industries with the best prospect of profitable expansion as a result of war conditions, in the belief of H. R. Mac-Millan, outstanding British Columbia

lumberman and exporter.
"There's nothing artificial or phoney about pulp and paper making in this part of the world," said Mr. MacMillan. "From the standpoint of resoruces in "From the standpoint of resoruces in raw material, power, labor supply and transportation facilities, pulp and paper are a 'natural.' We don't have to bring in any of the materials needed from elsewhere. They're all right here at our

command." Although Mr. MacMillan has confined his activities in the past to lumber, he announced this month expansion of his plywood plant on the Fraser River by addition of a \$300,000 unit.

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Trends and Developments in Ceramic Wares for Industrial Use

by J. GORDON ADDERSON*

SINCE the members of the Technical Association are vitally concerned with advancement in products and with advancement in products and production of the pulp and paper industry, I believe that a review of the same phases of the ceramic industry will be of interest. The ceramic industry, or that industry which utilizes the principles of heat application to non-metallic and non-organic materials, covers a field of non-organic materials, covers a field of products including structural clay prod-ucts, refractories, whitewares, glass, enameled wares, abrasives, cements, limes and plasters and electrical and thermal

To cover such a wide variety of products would lead to an endless discussion, ucts would lead to an endless discussion, but the several types of ceramic materials, especially made for industrial use are of particular interest to TAPPI, particularly since ceramic products of this type find wide usage as integral parts of pulp and paper processing units. Let us then limit the scope of this paper to include only the industrial ceramic products such as chemical resistant wares, refractories, and thermal insulating products.

Before entering into a discussion of these individual materials, however, it is necessary to acknowledge a trend in the ceramic industry which has served as the fundamental means for the comparatively recent and rapid development in ceramic products and methods of pro-cessing. This trend is the ever increas-ing application of technically trained men and technical methods in the solumen and technical methods in the solution of service, production and product improvement problems. The ceramic industry, while it is one of the oldest known industries, was one of the slowest to realize the possibilities in applied technical background. However, in the past two decades such positive advancements have resulted from applied ceramic technology that it is now accepted as an indispensable part of progressive ceramic operations. As a direct result of the general acceptance of applied ceramic operations. As a direct result of the general acceptance of applied ceramic technology, we find many product de-velopments, process improvements and a better fundamental understanding of requirements in supplying ceramic materials for industrial service.

In supplying materials for resistance to chemicals, the better understanding of service conditions made possible through technical background, has permitted a more logical recommendation of materials for the various types of service to be encountered. Also several mechanical developments are being utilized to improve the properties of chemical wares. Finer grinding equipment and vacuum processing equipments which permit the removal on entrapped air in the clay bodies have been comair in the clay bodies, have been combined to make possible the manufacture of denser, stronger and mechanically more perfect wares. Also, the manufacture of more complicated shapes is made practical by these mechanical improvements.

Other potential advances in the chemical resistant field are found in the synthesis of artifical minerals with predetermined desirable properties. ample of one such material which shows promise is the mineral Cordierite. This material is made from the combination at high temperatures of the oxides, Magat high temperatures of the oxides, Magnesia, Alumina and Silica in the proper ratio. The resulting artificial mineral possesses a marked resistance to ordinary acids and alkalies and has a co-efficient of thermal expansion considerably lower than Pyrex glass. While research on this material is as yet incomplete, it is possible that it will find application in digesters as well as in other services where resistance to thermal shock and acids or alkalies are important factors. Cordierite also shows much promise in the field of high-frequency electrical insulators. There are, of course, numerous other materials of a similar type berng investigated at

this time.

As we leave the chemically resistant wares it is natural that we think of re-fractories which are indispensible in many of our local industrial operations. By reason of the great complexity of By reason of the great complexity of service conditions to which refractories are applied, much study has been neces-sary in arriving at the present stage of development in the field of refractory products and applications of these ma-terials. In making the studies necessary for the advancement of refractories, ceramic technology has played a major part. It has, however, been supplemented by much study and information supplied by refractory consumers and it is the willingness of the consumer to co-oper-ate, coupled with the development of advancing ceramic technology that will lead to constantly improving refractories ap-plications. Refractories are generally recognized to be an expensive necessity and often, if improperly manufactured or applied in service, a genuine nuisance.

Misapplications Cause Failures

 Realizing that conditions of refrac-tory misapplication are quite common, a diligent scientific study by ceramic in-dustrial and research organizations has been carried on in recent years to debeen carried on in recent years to de-termine the mechanics involved in re-fractory failures and to intelligently apply the resulting information in the improvement of materials for specific

A brief review of the results of the previously described studies as they apply

to the more common possibilities for re-fractory failure will be of interest.

Spalling has been found to result from either thermal shock, mechanical abrasion or stress, or from structural change

in the body of the refractory. Combina-tions of two or three of the types of spalling are, of course, possible.

Thermal spalling is a disintegration of Thermal spalling is a disintegration of the refractory along weakness planes de-veloped from repeated cycles of heating and cooling of the mass. Such a series of repeated heating and cooling cycles causes tensile and shearing stresses re-sulting from contraction and expansion of the refractory... These stresses finally cause fractures perpendicular to, or at 45 degree angles with the heated and cooled surfaces with subsequent disintegration.

Mechanical spalling is a disintegra-tion of the refractory caused in breaking away clinker or similar adhering mate-rial which, when removed, pulls some of the refractory with it. Also, a failure in compression of the heated surface of the refractory as a result of expansion of this surface is classed as mechanical spalling.

Structural spalling is usually a result of increased vitrification of the refracor increased vitrification of the refrac-tory while in service due either to the fluxing action of slags or to the fact that the refractory was not thoroughly matured in manufacture.

The shrinkage of refractories in service is usually a result of a surface fluxing or of under-firing with the consequent incomplete recrystallization and removal of shrinkage in the manufacturing op-

eration.

Failure of refractories under service load is caused by a partial fusion or softening of the material. Such softening results in a plastic flow of the mass when the extent of the softening has progressed to a degree which will no longer permit the skeleton grains of the refractory to resist the superimposed load. Load failure is sometimes confused with fusion or melting of refractory settings. Improved designs of suspended arch and wall construction are effective in eliminating load failures but many cases of refractory installations still require careful consideration from a standpoint of load.

point of load.

Slag attack on refractories is a function of temperature, the chemical characteristics of the refractory and contactacteristics of the refractory and contacting slag and atmosphere and the density
of the refractory. Two contacting refractories of opposite chemical nature
will suffer from slag action.

Fusion, while it is a possibility for refractory failure, is seldom experienced
and is usually a result of misapplication
of material or flame impingement on
the refractory.

the refractory.

Contacting atmospheres have been found to have appreciable effect on refractory life. Strongly reducing atmospheres in contact with refractories containing free iron oxide have been found to cause a deposition of carbon in the refractory. As the carbon deposition takes place within the mass, a tendency for disruption of the refractory body structure is developed. Such deposi-

^{*}Assistant Superintendent, Gladding, McBean & Company, Renton, Washington. Presented at the Dinner Meeting sponsored by the Pacific Section of TAPPI, at Seattle, Washington, on March 7th, 1939.

tion often results in a shattering and subsequent disintegration of the refractory setting. Acid or alkaline fumes in combustion gases have also been known to effect refractory settings especially at the bonded joints where certain types of cementing materials may be affected.

With the foregoing brief analysis of the main possibilities for refractory failure and with data on the infinite number of supplementing conditions which may influence refractory service as guides, ceramic research has been directed toward the improvement of materials to meet a constantly increasing severity in service conditions.

Research Improving Ceramic Products

• A careful analysis of the causes for refractory failure revealed that, to a large extent, the elimination of each of the several failure possibilities required opposing characteristics in the refractory. For instance, under-burned brick will usually resist spalling very readily but would be susceptible to shrinkage, load failure and severe slagging in service, or, a siliceous brick, while it could be expected to resist load and shrinkage tendencies, would probably suffer badly from spalling and slagging.

As a result of a more complete understanding and appreciation of such existing conflicts in supplying correctly applied refractories, the typically progressive ceramic research organizations have undertaken the development of a line of specialized products each of which is intended to meet certain specific conditions encountered in the various fields of

application for the products in question. In following such a policy it is our custom to make a thorough study of expected service conditions with regard to type of refractory setting, fuel, operating conditions, etc., and use the collected data resulting from such a study as a basis for recommending one of several materials which have been specifically manufactured to withstand the conditions encountered in local refractory applications.

The trend toward specilization which has resulted from a technical analysis of the various phases of the refractories field is probably the greatest single step in the improvement of wares for refractory service.

Fireclay Refractories

• Since fireclay refractories are of particular interest in the northwest from a manufacturing standpoint as well as from the standpooint of service in the pulp and paper industry of this section, let us see what variables may be utilized in the manufacture of fireclay refractories to effect the specialization of materials of this type for specific service conditions.

this type for specific service conditions. The more important of these processing variables are; the nature and proportion of the various raw materials used, the fineness of grinding and the proportion of various grain sizes used in batching the raw materials, the amount of moisture used in pressing and the method of pressing, the molding pressures used and the nature of the firing treatment to which the ware is subjected.

A detailed analysis of the effect of these variables in the final characteristics of a product would be beyond the scope of this paper. However, we shall attempt as briefly as possible to generalize their effects as possible aids in better analyzing the products on the local market.

Generally sepaking, the ingredients of a fireclay brick consist of plastic bond clays to facilitate manufacture and lend strength to the brick, non-plastic refractory filler clays, and possibly precalcined materials known as grog. The non-calcined portion of the batch may be of a silicious (more than 60% SiO₂ burned basis) or non-silicious variety. By varying the ratio of these three types of materials from low grogged to highly grogged bodies and from plastic to non-plastic bodies, it is possible to greatly change the resulting product.

Low grogged bodies are less expensive and often very dense, which is usually desirable for resistance to slag, but spalling and load resistance of this type of body is usually below par. The newly developed "all flint brick" is a possible improvement in the low grogged type of fireclay refractory.

As the grog content increases up to 60 or 70 per cent of the batch, greater spalling and load resistance and less tendency for service shrinkage may be expected. However, greater manufacturing control of highly grogged bodies is essential to insure proper strength, density and mechanical perfection. Highly grogged fireclay bodies are usually considered to be superior for general service work but are more expensive. Superduty fire-clay brick are of the highly grogged type.

Silicious bodies usually exhibit a fair resistance to load at high temperature but are readily attacked by alkaline slags and show marked tendencies to spall.

Highly aluminous bodies (above 50% Al₂O₃) have a marked resistance to alkaline slags and can, by grogging highly, be made into brick which will not shrink or suffer under load. Improperly processed highly aluminous bodies will usually show tendencies to shrink and slump under load at high temperatures.

under load at high temperatures.

Fine grinding and grain size proportioning open a wide field of new possibilities in varying the properties of fireclay refractories. This is particularly true in the field of highly grogged bodies where for the most desirable results the grog grains are sized between positive limits. The grains of various sizes are then recombined in definite proportions with the collodial clay material. Such a mixture, when subjected to pressing action, will permit the densest possible body to be produced with a minimum of void space between grains. At the same time the maximum interlocking of the nonplastic grains is effected with the very fine plastic material filling the interstices. Such an interlocking of grains is desirable in overcoming spalling, load failure and shrinkage tendencies and the increased density resulting from grain sizing increases the resistance to slag and atmospheric penetration.

The amount of processing moisture used in a body determines the one of the three usually accepted methods of pressing which is to be used. These three methods are; the soft plastic or hand mould method with or without subsequent pressing, the stiff plastic method with or without subsequent pressing, and the dry-pressed method.

Products made by the soft plastic or hand mold methods are generally considered to possess the following characteristics; good spalling resistance, low strength at high and low temperatures, poor tayloring, low abrasion resistance and because of the usually high porosity, they are susceptible to slag and atmospheric attack. Repressing in the par-

tially dried state is often resorted to as a means of improving the mechanical appearance of the soft plastic product. The stiff plastic process, utilizing a 0

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The stiff plastic process, utilizing a somewhat lower moisture content than the soft plastic method, produces ware with a fair spalling resistance if mechanical weaknesses peculiar to the process are effectively eliminated. Ware manufactured by this process usually possesses good hot and cold strength, a high resistance to abrasion, and because of increased density, it will usually be quite resistant to slagging action. Repressing is necessary to produce a well taylored product by the stiff plastic method.

The dry press method involves forming the ware from a body which is in the powder form with only enough moisture to promote bonding at very high pressures. This process is rapidly gaining favor for refractory manufacture and is now the more important method of the three.

Because of its homogeneous structure, ware produced by this method has a high spalling resistance and, if the body is properly proportioned and controlled, a high resistance to load, abrasion and slag and a high degree of mechanical perfection may be expected.

The application of the recently developed vacuum system to any of the three processes will remove entrapped air from the clay mass with a consequent increase in density and strength and a decrease in mechanical imperfections resulting from air pockets.

Presses capable of unusually high

Presses capable of unusually high molding pressures have been recently developed. These presses permit a more intimate contact and mesh of the grains of refractory bodies to be effected with the consequent advantages in load resistance, strength, spalling and density.

or retractory bodies to be effected with
the consequent advantages in load resistance, strength, spalling and density.
The trend in burning fireclay refractories has been toward kilns with
smaller burning chambers in which the
temperature can be more accurately controlled. Smaller chambers also reduced
the tendency for distortion of the ware
in the burning operation because of excessive loading.

The more accurate temperature con-trol and the reduced loads on the ware being burned permits the burning opera-tion to be carried on at higher temperatures than were formerly used for similar purposes. Burning at the higher temperatures and under accurately controlled conditions such as we have in the modern railroad tunnel kiln makes it passible to effect to a greater degree of completeness, the various pyro-chemical reactions necessary in producing high type fireclay re-fractories. Two of the more important of these reactions are the conversion of the alumina and a portion of the silica into the more desirable crystalline mullite and the conversion of iron oxide into the silicate by reaction with silica liberated in the mullite crystallization. Both of these reactions are accompanied by a softening or partial fusion of the re-fractory. Hence, the desirability of completing these reactions before the material goes into service. Because of the softening that does take place, incomplete burning reactions were very com-mon before the advent of the tunnel kiln because of the serious distress shown if the ware under its own great weight was brought to the most desirable reaction temperatures in the older methods of periodic kiln burning.

A prominent development of crystalline mullite is essential in the burning fireclay refractories if they are to possess

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high mechanical strength accompanied by good spalling resistance, slag resistance and load resistance, for it is the intermeshing of the mullite crystals which produces general ruggedness in the ware.

• Underfired fire clay brick are likely to be friable and porous and consequently are easy prey for slags and abrasion. Underfiring fails to convert the iron oxide into silicates and thus a marked tendency for carbon deposition and subsequent failure is created. Also, underfiring is likely to result in service shrinkage if the previously mentioned pyro-chemical reactions take place in service instead of in the manufacturing operation.

Besides the advantages of tunnel kiln burning from the standpoint of quality of product, it is a continuous and consequently more efficient operation which expedites the movement of the ware through the plant. Tunnel kiln development has contributed a major advance

to refractory manufacture.

We have thus completed our brief review of the variables of fire-clay refractories manufacture and have attempted to show how these variables may effect the characteristics of the fireclay type of ware. There are, however, many other types of refractories in which specialization is developed to a greater degree than in the up-to-date fire clay refractory production. Let us briefly review the outstanding characteristics of some of these highly specialized types.

Special Refractories

● The High Alumina refrectories are made from diaspore or other highly aluminous clays and sold under guarantees of certain percentages of Al₂0. These materials find their greatest application in the Portland Cement industry or where alkaline slags are a serious factor. An inherent tendency toward continued service shrinkage can be overcome to a large extent by addition of grog and high temperature firing.

temperature firing.

Super refractories, as distinguished from the highly grogged super duty fire-clay refractories, are products made from bonded crystalline grains of mulite, silicon carbide, alundum or similar materials. Sillimanite or mullite brick, silicon carbide brick and bonded fused alumina come in this class as do the mullite bricks which are cast from a molten slag produced by electric furnace

These materials are characterized by their low thermal expansion, high density and strength, high resistance to load, resistance to slags and abrasion and high cost. Sillimanite or mullite brick would seem to be adaptable to service along the slag line of Dutch ovens where fireclay brick are often found wanting.

Special metallurgical refractories which

Special metallurgical refractories which include silica, magnesite, and chrome bricks are noted for low spalling resistance. The chrome and magnesite types show very poor load resistance also but silica refractories are highly resistant to load at high temperatures. Chrome is considered to be chemically neutral at high temperatures whereas magnesite resists basic slags and silica is acid resisting. Newly developed chemically bonded magnesite and chrome bricks are found to be the higher lead and resulting register.

Newly developed chemically bonded magnesite and chrome bricks are found to have higher load and spalling resistance than those possessing the customary ceramic bond.

Synthetic minerals such as forsterite and the spinels are showing promise of invading the metallurgical refractories field for certain specific uses.

There are numerous other materials such as dolomite, zirconium, carbon, beryllium, etc., which possess characteristics suitable for refractory service under highly specialized conditions.

• Refractory cements and plastic refractories have been the point of much of the ceramic research in recent years. It has been found that cements chemically suited to the refractories with which they are used are essential for best results. Chrome cements being of a chemically neutral character can and have been widely used. However the choice of proper bonding materials whether of the air-setting or heat-setting types is a possibility for effecting appreciable savings, for if the mortar is properly adapted to the refractories it can be expected to give a good performance and may be purchased at lower prices than chrome cements. In general it is desirable to purchase bonding mortars from the manufacturer of the bricks with which it is to be used. Such a procedure will insure the proper chemical relationship between bond and bricks.

Plastic refractories are finding a wide application for boiler service and patchwork both in marine and stationary boilers. Monolithic walls constructed from refractory plastics are often desirable. Chrome plastics find application where rapid heat transfer or a chemically inert material is desirable. Hydraulic setting castable refractories are used where service conditions are not too externes.

Ceramic Insulating Materials

● Many ceramic insulating materials have been marketed in recent years. Among these are the insulating refractories, insulating brick and various types of insulating cements, plastics, castables and fills. The insulating refractory is a lightweight porous refractory material which can be used up to 3000°. F. if slags, ashes or loads are not encountered. Its primary purpose is that of increasing thermal efficiency where corrosion or load is not a serious factor.

Insulating brick are also intended to primarily increase thermal efficiency and are used as backing material, or in some cases in contact with flame up to 2000° F. if no corrosion is expected. The insulating plastics and fills are similarly used. A new development in the insulating

A new development in the insulating field is the use of an expanded micacious material known as Vermiculite. When permanently expanded by heating, this material possesses good insulating properties and is now used as a base for practically all types of insulating materials including fill, brick, plastics and castables

We have attempted in presenting this paper to show the trend toward a specialization of ceramic products for specific industrial applications and have indicated to a degree how this specialization is accomplished by a development of many types of materials to meet specific conditions and by varying certain characteristics within a given type. In the northwest we are definitely striving to build a line of products specifically suited to the service conditions encountered locally. To this end we solicit the continued co-operation between the users of our products and our technical and sales staffs in order that we may continue to understand the requirements of the various installations.

we are confident that, through our constantly developing technical background and our improved methods of

processing and manufacturing control, that we will be able to meet the challenge to our products which has resulted from constant increases in severity of service. We are keeping pace with the specialization trends and technical developments in the manufacture of ceramic products and feel a very definite responsibility in providing the Pacific Northwest Industries with materials specifically designed and manufactured for local requirements.

Stockton Plant of Fibreboard Expands Floor Space

• From "The Fibreboard Craftsman," published by the employees of the Stockton, California, mill of Fibreboard Products, Incorporated, the following story concerning the new carton plant is reproduced:

"When an industry continues to find new uses for its products, produces quality products at the lowest possible cost, meets its customers' demands for service, and maintains friendly employer-employee relations, it is bound to grow. "Our organization here at the Stock-

"Our organization here at the Stockton plant tries to do these things and has met with better than average success as is evidenced by the increased carton sales during the last few years, and the consequent necessity for more manufacturing and storage space in the carton department. New products manufactured and an increased demand for some of our older lines has caused much congestion in our carton and shipping departments. In other words our carton plant has outgrown its buildings. "Because of this growth we are about

"Because of this growth we are about to see a new building going up in our front yard. (Construction is now well along.—Ed.) It will be a two-story brick and reinforced concrete structure about 145 feet square and will be located between Church Street and the paster roll pit. The building will extend east to the present trucking aisle at the miehle press deliveries. This will comprise an area of about 42,000 square feet, including both floors, which has been estimated to be adequate for present manufacturing needs and will provide the necessary additional storage space needed for raw stock from the paper machines and work in process.

"After the building is completed and during the slack season this winter the four litho presses, which we now use, will be moved in, together with the transfer room and its equipment. The litho press arrangement will be substantially as it is now with delivery elevators to the basement. Of course there will be plenty of room for winding sheets in the new basement and the area now used for winding sheets will be available for the tripping department, providing them with much needed space.

"Another major change, made neces-

"Another major change, made necesary by the increasing amount of our products that must be shipped by truck in order to meet our customers' demands for faster delivery, is the construction of our present carton department. The loading platform will provide space for four trucks to load at one time which should eliminate much of the congestion in the shipping department. Trucks will drive to and from the loading platform over separate roadways.

form over separate roadways.

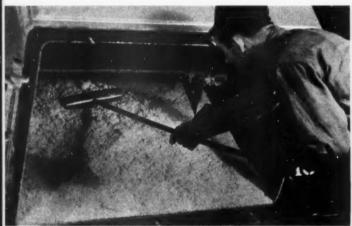
"The removal of the litho presses to the new building will make available about 10,000 square feet of space for pool truck storage."

How "Cellophane" Cellulose Films

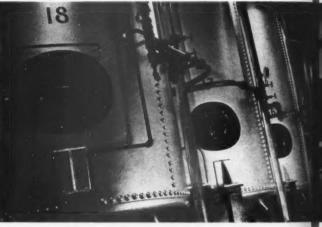


Where sheets of pure Western hemlock or spruce wood pulp are steeped in a caustic soda solution, the first step in the chemical process.

Loading a steeping press. In this equipment a chemical change takes place; the pulp sheets are converted to alka cellulose.



Next, we see the orange-colored cellulose xanthate "crumbs" after carbon disulfide has been added. Unfortunately, in this picture, the color change cannot well be shown.



After the xanthate is dissolved in another caustic sods what tion, the resulting viscose ripens under carefully-controlle conditions before it goes to a casting machine.



Here the film is seen passing through heavy squeeze rolls.

At this point all of the excess liquid is pressed out of it.



Snapped at the "dry end" as thousands of feet of finite "Cellophane" cellulose film were being wound on a "

il**ri**s made . . .

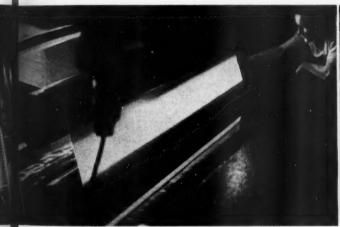
... at the Richmond, Virginia, plant, one of three operated by the du Pont Company. This is how pure cellulose, made soluble by chemical means, is regenerated and transformed into transparent sheets trade-marked "Cellophane."



After steeping, the sheets are removed and dumped into hoppers leading to shredding machines on the floor below.



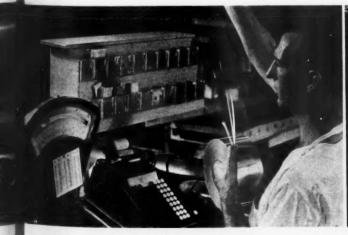
The chemically-treated and shredded alkali cellulose is now white and fluffy, resembling a mass of bread crumbs.



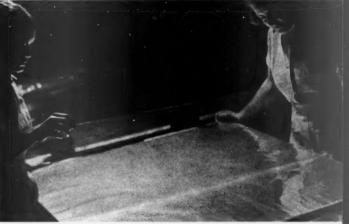
The liquid becomes a solid. Here the cellulose film is seen leaving the coagulating acid bath where the almost miraculous transformation takes place with surprising rapidity.



Rolling along through one bath after another, the film becomes progressively purer, more transparent, tougher and more pliable. This view shows only part of the long machine.



Rolls slit to meet the customer's specifications are usually used, and they pass through many inspections before shipment.



12 Some customers require "Cellophane" in the form of sheets, and these, too, are given the same careful treatment.

Photographs by courtesy of the Cellophane Division, E. I. du Pont de Nemours & Co.

The Sulfonation of Western Hemlock Lignin

by ARTHUR L. MOTTET*

Introduction

THE dissolution of lignin in wood by the sulfite process proceeds in two stages (for reviews of the chemistry of the sulfite pulping process see Hagglund (12) or Schorger (23)). First, the sulfurous acid and bisulfite of the liquor combines with the lignin to form bound lignin sulfonate acid and bound lignin sulfonate. These sulfur compounds of lignin remain in the solid phase until the second stage of dissolution begins, which stage consists of the hydrolysis and solution of the sulfonated lignin. The present work is concerned with the sulfonation stage.

Review of Literature

● The first contribution to the understanding of the mechanism of the lignin sulfonation reaction was made by Klason. This indicated that sulfonation occurs by the addition of the sulfurous acid or bisulfite of sulfite cooking liquors to an ethylenic linkage in the lignin molecule to form a very stable lignin sulfonic acid or lignin sulfonate in the following manner (20):

Tollens and Lindsey (24) had previously shown that lignin sulfonic acids were products of the sulfite cook. This original conjecture was confirmed and the knowledge of the reaction was extended by the later work of Klason and other investigators, principally Hagglund and his coworkers (8, 9, 10, 11, 13, 19). Klason's work was presented in connection with his studies on the constitution of lignin and its sulfite derivatives and has been ably reviewed by A. J. Bailey (1).

After solution of the bound sulfonated lignin has taken place, further sulfonation of the dissolved lignin may occur in two ways, viz., by the addition of sulfurous acid to still more double bonds present in the dissolved lignin or by addition of an aldehyde group freed in the process of hydrolysis of the lignin sulfonate from carbohydrates of wood. In contrast with the former reaction, the latter forms a very unstable union and is easily decomposed. The sulfur dioxide combined in this manner may be regarded as "loosely combined." While the sulfonated lignin remains in the solid phase, no loosely bound sulfur dioxide is present. Hagglund and Carrick (16) have shown that 50% to 60% of the sulfur dioxide consumed in the sulfur cook is used to form compounds in which the sulfur is firmly bound, 20% to 30% for those in which the sulfur is sirmly bound, 20% to form sulfuric acid. It was stated that

the amount of sulfur loosely combined depends on the "free" sulfur dioxide content of the liquor, while the concentration of bisulfite is of significance in the formation of compounds in which the sulfur is firmly bound. Experiments on the sulfonation of lignin isolated by the hydrochloric acid method revealed that the ability of lignin to react with sodium bisulfite is not destroyed if the isolation is carried out under mild conditions (15, 18).

Cross and Engelstad (3) digested cinnamic aldehyde with aqueous sulfur dioxide and found that this aldehyde behaved in a manner analogous to lignin. The additive aldehyde hydrogen sulfite was formed in addition to the sulfonic acid; the former was easily decomposed by boiling. No double bond group in the benzene nucleus was sulfonated.

Experiments by Hagglund and Ringbom (19) on the sulfonation of unsaturated organic acids indicated that

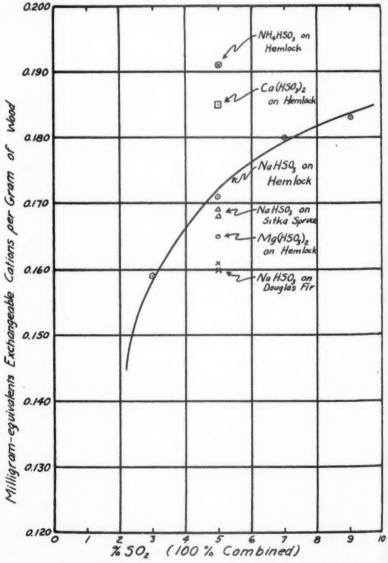


Figure 1 - Relation Between Total 502 and Degree of Sulfonation

^{*}College of Forestry, University of Washington, Seattle, Washington.

temperature and the concentration of the bisulfite ion are factors in the control of the rate of sulfonation. Hagglund, Ekwall, and Hostomsky (17) found that sulfonation of spruce wood lignin with sulfurous acid and bisulfite begins at a temperature as low as 70° C. and that the rate of sulfonation is greater with sulfurous acid than with bisulfites.

Friese et al (5, 6, 7) have conducted investigations in the sulfonation of lignin in an entirely different connection with no relation to the sulfite pulping process, and therefore these have no bearing on the present work.

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Experimental Procedure

• In the present study of the sulfonation reaction of lignin, the phenomenon of cation exchange was employed to determine the degree of sulfonation. It was established by Kullgren (21) that sulfite pulp exhibits the permutitic characteristic of having exchangeable cations, this cation exchange arising from sulfonated lignin present in the cellulose. This reaction was expressed as follows:

(R represents a sulfonated lignin radical presumably chemically united with the carbohydrate material in wood or sulfite pulp.)

Obviously, the ratio of the quantity of exchangeable cations in sulfonated wood or sulfite pulp to the quantity of organically bound sulfur is 1:1, and the determination of total exchangeable cations affords a simple and rapid means of determining the amount of organically bound sulfur, or the degree of sulfonation of the lignin in wood. The method of determining the total amount of exchangeable cations used by the writer is essentially that described by Kullgren (22), with only slight modifications.

The sulfonated wood flour was filtered and washed on a Buchner funnel provided with a filter paper. To drive off all the metal ions in the bound lignin, i.e., to drive the above recation completely to the left, about 50 mls. of .2N HC1 were poured on the flour in the funnel and allowed to stand a few minutes. This solution was then drawn off by the application of suction and another similar quantity of dilute HC1 was introduced and drawn off after standing a few minutes. This procedure was repeated until 250 mls. of the dilute HC1 had been poured through the sulfonated wood, after which one liter of distilled water (condensed on block tin) was passed through the flour. Approximately one gram (dry weight) of the sulfonated wood was then weighed (to the nearest .1 gram) in the moist condition and introduced into a 125 ml. Pyrex glass-stoppered Erlenmeyer flask. One hundred mls. of 1N NaC1 was introduced and the contents of the flask shaken well. With this quantity and concentration of NaC1 solution the cation exchange reaction given above is driven almost completely to the right. In order to determine the amount of hydrogen ion released, a 25 ml. aliquot of the solution was pipetted off after the wood had settled out and titrated against 01N NaOH. The wood was filtered on a tared Gooch crucible, washed, dried, at

105°, and weighed on an analytical balance

Western hemlock (Tsuga heterophylla) wood flour was prepared with a cabinet-maker's rasp. Samples of the flour weighing 1.5 grams were sealed in Carius tubes (Average dimensions: outside diameter, 20 mm.; inside diameter, 15 mm.; length, 250 mm.) with 25 mls. of cooking liquor. In order to prevent the flour from settling out, and to insure adequate circulation, the tubes were continuously agitated during the cooking period.

Four series of cooks were run to determine: (a) the effect of concentration of bisulfite, cation, and species on the rate of sulfonation, I, (b) the effect of the relative concentrations of free and combined sulfur dioxide on the rate of sulfonation, II, (c) the effect of temperature on the rate of sulfonation, III, and (d) the relation between time and degree of sulfonation, IV.

For Series I, the cooking liquors were prepared by dissolving "C.P." sodium bisulfite in distilled water to obtain solutions containing 3.0%, 5.0%, 7.0%, and 9.0% sulfur dioxide. Cooks were made on 1.5 gram samples of western hemlock flour with each of these cooking liquors. To compare the rate of sulfonation of western hemlock with Sitka spruce (Picea sitchensis) and Douglas fir (Pseudotsuga taxifolia), samples of wood flour of these species were cooked with the 5.0% solution of sulfur dioxide (as sodium bisulfite.) To determine the effect of other cations on the rate of

sulfonation, ammonium bisulfite, calcium bisulfite, and magnesium bisulfite solutions with 5.0% sulfur dioxide were made up in addition to the sodium bisulfite solution. The ammonium and magnesium bisulfite solutions were prepared by dissolving the calculated quantity of the neutral salt in an aqueous solution of sulfur dioxide, while the hydroxide was used in making up calcium bisulfite. All Carius tubes were heated simultaneously in an electric oven. The tubes were brought up to a temperature of 95° in one-half hour and maintained at this temperature for on hour, after which they were removed from the oven and cooled with tap water. The total amount of exchangeable cations was determined on each of the samples by the method previously described.

In Series II, a cooking liquor with 5.0% total sulfur dioxide was used throughout; however, the relative amounts of free and combined sulfur dioxide (as sodium bisulfite) were varied as follows: (a) 5.0% free, 0.0% combined; (b) 4.0% free, 1.0% combined; (c) 3.0% free, 2.0% combined; (d) 2.0% free, 3.0% combined; (e) 1.0% free, 4.0% combined; (f) 0.0% free, 5.0% combined. The tubes were heated in the same manner as those of Series I and the total exchangeable cations subsequently determined.

subsequently determined.

In Series III, a sodium bisulfite liquor with 5.0% sulfur dioxide was employed. In this series the heating of the Carius tubes was carried out separately in a water bath in order to control the tem-

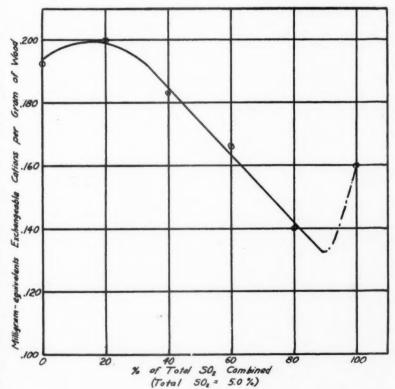
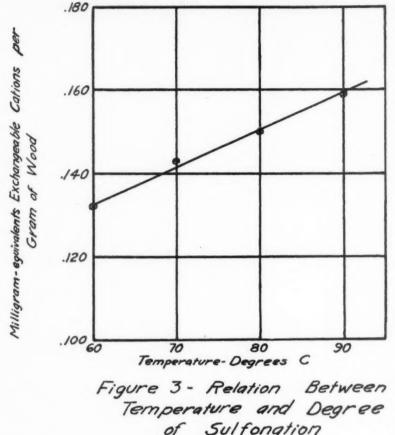


Figure 2- Relation Between Relative Concentration of Free and Combined SO₂ and Degree of Sulfonation



perature more accurately than was possible in the electric oven. Cooks at temperatures of 60°, 70°, 80°, and 90° were made, no allowance being made for the time required for the cooking liquor to reach the cooking temperature, which time was assumed to be negligible because of the extremely large ratio of surface to volume. At the end of the cooking period each tube was immediately cooled in cold water. The usual determinations of exchangeable cations were run.

In Series IV, nine wood samples were cooked in sodium bisulfite solution containing an equivalent of 5.0% total sulfur dioxide. One of the tubes contained wood ground by mortar and pestle until it was in an extremely finely divided condition. The tubes were placed simultaneously in the oven in which the temperature was controlled by a thermostat at 95° plus minus ½°. One was withdrawn after ½ hour; the tube containing the finely divided wood and another of the ordinary samples were withdrawn after 1 hour. Subesequently tubes were withdrawn after 4, 8, 24, 48, 72, and 100 hours had elapsed, and cation exchange determinations were run on all samples. The results are indicated in Figures 1 to 4.

Experimental Results and Conclusions

 It is apparent from Figure 1 that the rate of sulfonation of western hemlock lignin with a sodium bisulfite solution (temperature and time held constant) varies with the concentration of the bisulfite in a very definite manner. About 15% greater sulfonation was obtained with the 9.0% solution than was obtained with the 3.0% solution. At higher concentrations small changes were not as effective in changing the sulfonation rate as changes at lower concentrations. If Hagglund's contention that rate of sulfonation is dependent on the concentration of the bisulfite ion is correct, the flattening of the curve rises from the fact that at higher concentrations, increases in concentration of sodium bisulfite are not accompanied by corresponding increases in "effective concentrations" of bisulfite ions.

It is quite probable that the striking differences between the sodium, ammonium, calcium, and magnesium bisulfites have their origin also in different effective concentrations of bisulfite ions. However, caution is to be employed in drawing any conclusions from the results obtained here on calcium and magnesium bisulfites since in the course of making up these solutions the escape of undetermined quantities of sulfur dioxide might have made significant changes in the composition of the liquor. Nevertheless, the high sulfonation rate of the ammonium compound, is significant and undoubtedly explains the superior cooking action of ammonia base liquors in contrast with the sodium, magnesium, and calcium base liquors, as reported by Cross and Engelstad (4).

It is evident from Figure 1 that while Sitka spruce and western hemlock will sulfonate approximately to the same de-

gree under identical conditions, Douglas fir lignin is much more difficult to sulfonate. It is quite possible that this difference originates in chemical differences of the lignin of these species (1).

From Figure 2 it is apparent that the relative concentration of free and combined sulfur dioxide is a governing factor in determining the speed of sulfonation. The maximum rate of sulfonation appears to develop when the cooking liquor contains somewhat less than 20% of combined sulfur dioxide, contrary to the expectation that this point would be at a concentration of 100% free sulfur dioxide (17). The minimum rate apparently falls somewhere between 80% and 100% combined sulfur dioxide, and it is evident that the pure sodium bisulfite solution has a greater sulfonating effect than mixtures of sulfurous acid and the bisulfite until the free acid makes up about 50% of the total sulfur dioxide content of the liquor. Further research will be necessary to establish this relationship with greater accuracy.

The conclusion that might be drawn from Figure 3 is evident: a straight-line relationship exists between sulfonation rate and temperature. Furthermore, the reaction speed increases only very slowly with an increase in temperature, there being only a 20% increase for a temperature increase of 30°. This fact has a far-reaching significance in the commercial sulfite cook. Hagglund and Arnold (14) have shown that it is in incompletely sulfonated lignin that the tendency for resinification with the resultant "black cook" is most pronounced. It is apparent, then, why there is little to be gained in raising the cooking temperature too rapidly during the first stage of the cook, for the sulfonation rate is increased only very little and the danger of resinification of the partly sulfonated lignin is greatly increased.

The fact that a straight-line relationship exists here probably indicates that the speed of the reaction is limited by the diffusion rate, which is itself a straight-line function of temperature. The flatness of the curve would then be due to the high resistance of the wood to the diffusion of bisulfite ions.

The most obvious conclusion that might be drawn from Figure 4 is that there are two types of lignin in the wood, viz., an easily sulfonatable and a difficultly sulfonatable lignin. Under the conditions under which these cooks were made, the former type can be considered to have been completely sulfonated at about the fourth hour, after which the sulfonation curve rises very slowly, but this rise is sustained even until one hundred hours had elapsed. It may be mentioned incidentally that the cooking could not be carried out under these conditions beyond the hundredth hour because the cooking liquor began to show a slight yellow coloration, indicating that the solution of the bound sulfonated lignin was beginning. Roughly speaking, a little over one-half of the lignin sulfonated was very rapidly sulfonated. The first explanation which presents itself is that this difference arises from the difference in accessibility of middle-lamella lignin and secondary wall lignin to the bisulfite ions (2). This conjecture is at least partly confirmed by the fact that the finely divided wood sample sulfonated more rapidly than the

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corresponding coarse sample, indicating that the time required to sulfonate the lignin in intimate mixture with the cellu-lose was dependent on the time required 1056 was dependent on the time required for the sodium bisulfite to diffuse into the cellulose. However, chemical differences in the sulfonatable groups in lignin are not precluded.

Summary

- (1) A review of literature on the sulfonation of lignin with reference to sul-fite wood-pulping processes is presented.
- (2) A technique involving the use of cation-exchange in the study of the sulfonation of lignin is described.
- (3) Data on the sulfonation of west-ern hemlock lignin are presented includ-ing (a) the relation of concentration of total sulfur dioxide to the rate of sul-fonation, (b) a comparison of sodium, ammonium, calcium, and magnesium bisulfites in the sulfonation of lignin, (c) a comparison of Sitka spruce and Doug-las fir with western hemlock on the basis of their ease of sulfonation, (d) the effect of the relative concentrations of free and combined sulfur dioxide on the speed of sulfonation, (e) the relation-ship between temperature and the rate of sulfonation, and (f) the relation between cooking time and the degree of sulfonation.

Acknowledgment

The writer desires to express his appreciation for the financial assistance of the Agnes Healy Anderson Research Fellowship Fund which made this investigation possible.

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Puget Sound Building Water Filter Plant The Puget Sound Pulp & Timber

Company has under construction a modern pressure filter plant with a capacity of 10,000,00 gallons per day. It is expected that the filter plant will be completed by November 15th.

pleted by November 17th.

The water, which is supplied by the
City of Bellingham, contains much foreign matter and varies in color seasonally, causing the pulp mill considerable
difficulty. As it was expected when the
new unbleached sulphite pulp mill was

built in 1938 that the water supply would be uniform in color and free of foreign materials, a filter plant was not installed

Alleging that the water supplied by the city was not up to representations made at the time the contract was signed, the Puget Sound Pulp & Timber Company recently requested the city to pay a part of the cost of installing the pressure filter plant. The city officials refused to ac-

cede to the company's request.

The filter plant was designed by the Northwest Filter Company of Seattle of which William R. Gibson is the head, and the equipment is being furnished by the same concern

New Pulp Concern Incorporated

● On September 28, 1939, articles of incorporation were filed with the secretary of state in Olympia, Washington, for the Lone Star Timber, Lumber & Pulp Company of Seattle. Incorporators were Lewie Williams, B. A. Grover and U. H. Fillio. Capital is \$30,000.

CZ Research Lab. To Be Ready November 1st

• The central research laboratory of the Crown Zellerbach Corporation is rapidly nearing completion, and research director William R. Barber expects to move his staff into the new building on or before November 1.

Frank Drumb Visits in Middle West

• Frank Drumb, mill manager for Pacific Mills, Ltd., Ocean Falls, B. C., spent several days at the Crown Zellerbach mills near Portland last month, then flew east to Wisconsin to visit rela-He made the return trip to the Coast by air.

Paper Mill Operations Rose 9.5% in September

• The weekly production ratio report of the American Paper & Pulp Association the American Paper & Pulp Association showed that the ratio of paper production to capacity was 94.6 per cent over the week ending September 2nd, when operations were at 85.1 per cent. The week ending on the 9th showed but 74.2 per cent due to the Labor Day shutdown.

For the entire month production was 87.9 per cent against 82.9 per cent in August and against 76.3 per cent in September, 1938.

Eoard production rose from 73 per cent for the week ending September 2nd to 82 per cent for the week ending September 30th, giving the month a board production operation of 75.4 per cent against 72 per cent in August and 66 per cent in September a year ago.

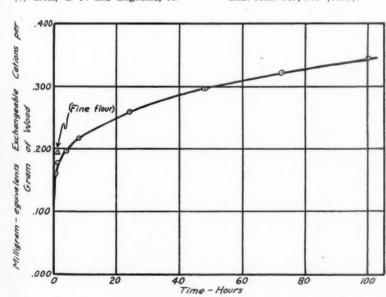


Figure 4 - Relation Between Time and Degree of Sulfonation

Use of Paper Milk Containers Expanded by Smaller Pure-Pak

Introduction of Excello Pure-Pak Milk Container Machine for dairies producing from two to three thousand units daily will extend use of paper milk containers to smaller communities.

• With the addition to the line of Pure-Pak Division, Ex-Cell-O Corp., of Detroit, of the "Junior," a new milk packaging machine, it appears that the use of paper milk containers will be considerably extended.

The "Junior" is designed especially for the small to average size dairy, and hence dairies that have found it impractical to use the large

Pure-Pak machine, can now profit-ably use the "Junior." "The 'Junior'," states Phil Huber, Ex-Cell-O Corp., president, "meets the apparent needs of small and average sized dairies. Similar to the Pure-Pak 'Senior,' which is now operating in leading dairies from Coast to Coast, this new machine does a complete packaging job in one continuous, automatic opera-

"The flat container blanks enter the 'Junior' forming unit at the front end an emerge-one every three seconds-from the other end filled with fresh milk, cream, buttermilk, cottage cheese, ice cream mix, and other dairy products ready for delivery to the dairy's customers. Quart, pint, and half pint Pure-Pak containers are completely packaged

on the one machine in the dairy." Pure-Pak "Junior" occupies only 50 square feet of floor space, as

compared to 90 square feet for the "Senior." It weighs less than five tons as against eight tons for the "Senior."

Pure-Pak is a product of the Ex-Cell-O Corporation, which for 20 years has been a leading manufacturer of precision machinery for the automobile, aircraft, railroad, agricultural industries and the United States Government. For the past five years Ex-Cell-O has manufactured Pure-Pak milk packaging machinery for the dairy industry.

On the Pure-Pak "Junior" machine container blanks are automatically picked up by vacuum cups and fed into the forming unit where the containers are shaped and the bottoms glued. Then the con-tainers are sterilized inside and outside with hot paraffin. This operation also hot-seals inside and outside the Pure-Pak pouring opening.

Following the hot paraffin bath the Pure - Pak containers pass through a refrigerating unit of an interesting new design. Quickly the containers are cooled to the temperature of the dairy products which are to be packaged.

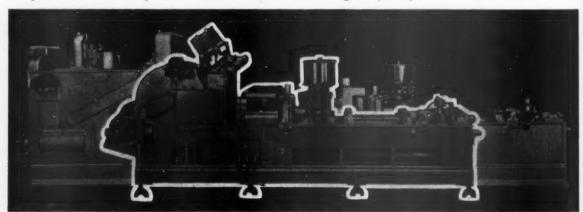
The "Junior" filling unit is of the piston type, said to be one of the most accurate in measuring dairy products. It is mechanical and positive in action as differentiated from gravity filling devices. Filler can be sealed by weights and measures authorities and it is designed for quick and easy disassembling for cleaning.

In the sealing and dating unit of e Pure-Pak "Junior" the filled the Pure-Pak containers are closed at the top by an ingenious operation. An electrically heated staple fastens the top. Then the sealed and dated package is delivered to the machine's platform ready for casing.

At no time during these opera-tions on the Pure-Pak "Junior" are the containers touched by human hands. Containers are under cover as they move along the machine.

One operator runs the Pure-Pak "Junior." He places a 10-minute supply of Pure - Pak container blanks in the automatic feeder and cases the finished product.

 To warrant installation of the "Junior" a dairy should produce from two to three thousand units per day. A unit is a quart, pint, or half-pint. To economically operate a "Senior" the dairy should produce from five to six thousand units per



A COMPARISON of the relative size of the new "Pure-Pak Junior" milk packaging machine with the larger "Senior" model 1 1 1 The new machine, designed to bring the advantages of the "Excello" paper milk containers to dairies producing from 2,000 to 3,000 units per day, is expected to aid materally in expanding the use of these containers and thereby increase the consumption of high quality paperboard.

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The Pure-Pak "Senior" is capable of turning out 44 units per minute, and the "Junior" 22 units per min-

There is little difference in design between the two models. Both the machines are manufactured by the Ex-Cell-O Corporation in Detroit, sold and serviced by the Pure-Pak Division with sales offices in Detroit, New York, Atlanta, Chicago, and San Francisco.

Sani Gard's New Los Angeles **Plant in Operation**

 The Sani Gard Cover Company recently established a new converting plant in Los Angeles. The firm's No. 1 plant is in Portland, Oregon. According to Warren Dunnell, owner and manager of the

ren Dunnell, owner and manager of the company, the original plant was located in Los Angeles, where the business was launched in April, 1931. The first plant was moved later to Portland.

The new factory is at 3101 Pasadena Avenue and is located in a single story, modern building which provides 3,000 square feet of floor space. It is a complete converting unit having all equipment necessary to make the complete toilet seat covers from rolls of tissue to packaged, ready-to-market product. packaged, ready-to-market product.

packaged, ready-to-market product.

All tissue used in the manufacture of the covers is from Northwestern mills. Two grades of tissue are used: No. 1, full bleached, mg 12 pound and special semi-bleached semi-crepe 12 pound. The No. 1 full bleached tissue is used in the making of the folded covers and the semi-bleached, semi-crepe for the rolled type. The folded covers are packed 1,000 to a carton. Containers, made of corrugated board, are manufactured in Los Angeles. The covers are sold in three brands: Safeway, Protex and Slide-Away. Mr. Dunnell states that they have developed a substantial domestic and ex-

port business, distributing through paper merchants only and finding a market throughout the United States. Their exthroughout the United States. Their ex-port business is to Canada, South Africa, Australia, New Zealand, the Philippine Islands in the main, with smaller ship-ments to other countries as well. The new plant is air conditioned. Offices are located here and a full ma-chine shop for repairing for all manu-

facturing equipment is maintained.

Demand Increases for Fibreboard Cases in B. C.

• The war in Europe has brought about a large increase in demand for fibreboard shipping containers in British Columbia for use in exporting canned fish, particu-larly salmon, to Great Britain and

"Ted" Cooper Is III

• E. W. G. "Ted" Cooper, assistant paper mill superintendent of the Crown Willamette mill at Camas, Washington, and chairman of the Pacific Coast Diviand chairman of the Pacific Coast Divi-sion of the American Pulp and Paper Mill Superintendents Association, is away from the plant again because of illness. It is not known how long he will be on the inactive list, but he hopes to be on the job again soon, and his friends are wishing him a speedy recovery.

Pacific Mills First Aid Team Makes Fine Showing

 Interest in first aid work among employees of Pacific Mills, Limited, at Ocean Falls, B.C., has been greatly stimulated as the result of the excellent showing made in the Dominion of Canada competitions by the Pacific Mills team.

This is the first year that a Pacific Mills team has taken part in the competitions. The first competition entered was for the Wallace Nesbitt Trophy, awarded annually by the St. John Ambulance Association of Canada and is open to all members of an accredited St. John organization in Canada except police and

militia units. The Pacific Mills team placed eleventh out of fifty-four teams competing throughout Canada and won second place among British Columbia teams competing.

A second competition is for the Tyro Trophy. It is open to any members of an accredited organization in Canada but team members, either as a group or individually, must have never previously taken part in a St. John Competition. The men from Pacific Mills ranked fourth out of twenty-nine Canadian teams competing for this trophy and were first among the British Columbia teams taking part.

Each team captain is given a separate test and out of one hundred and thirty-eight contestants in this division, Captain C. Langdon of the Pacific Mills team placed eleventh.

As so many of the first aid teams are located in far away towns it is impossible to hold a central contest. Colonel A. E. Snell of Ottawa, who is in command of the St. John Ambulance Association in Canada travels to the various towns and personally examines the teams. He visited Ocean Falls on July 6th and at a dinner given that evening after the examination had taken place he spoke very highly of the Pacific Mills team saying that their work was exceptionally good in view of their not having previously participated in the competitions.

The following men are members of the Pacific Mills, Limited, first aid team: Captain, C. Langdon, who holds a medallion and nine bars for twelve years of St. John work; H. Wrinch, who holds a medallion for three year's work; V. Whittaker, who holds a voucher for two year's work; G. C. Norman, who holds a certificate for one year's work; and, S. Best, who also holds a certificate for one year's work.

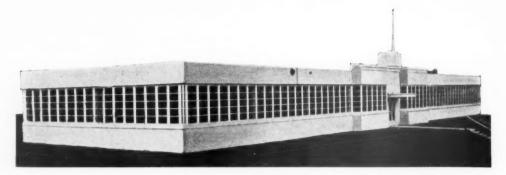
The first aid work at Pacific Mills, Limited, in Ocean Falls, B. C., is under the direction of Captain C. Langdon. C. J. Hague is personnel and safety supervisor.

First Aid Course Started at Lebanon

• A standard course in first aid in-struction was begun October 6th in Lebanon, Oregon, under the sponsorship of the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation. The course, open only to mill em-ployees, is in charge of John Simi as instructor.



PACIFIC MILLS FIRST AID TEAM which made such a fine showing in its first year of competition / / / Left to right, GEOFFREY NORMAN, HAROLD WRINCH, C. LANGDON, Captain; C. J. HAGUE, V. WHITTAKER, E. DELLAR, and the patient is S. BEST.



Central Technical Control and Research Laboratory at Shelton, Washington

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Paper Milk Bottle Demand Continues to Grow

 The number of California dairies now using American Can Co. paper milk containers, has just about doubled in the past two months, company executives announce.

There are now 16 dairies in the state using Canco paper containers—five are in Northern California and 11 in Southern California. The units per month, of all sizes, turned out on the Canco machines have increased to 3,500,000.

Early this month the company expected to have in operation their fine new paper container plant in Los Angeles, which will add considerably to the volume of paper used for milk containers.

Tim Turner Dies at Camas

• Harvey A. "Tim" Turner, clock room watchman for the past 18 years at the Crown Willamette Paper Company, Division of Crown Zellerbach Corporation's mill at Camas, Washington, died on September 14th at the age of 63. Mr. Turner had been an employee of the mill for 35

During this period at Camas he worked as a fireman, yard boss, and as a boss in the finishing room before taking over the clock room watchman's job. "In this latter capacity," said the Camas Post-Record, "his prodigious memory for names, faces, phone and card numbers amazed his fellow workers."

Scankraft Raises Kraft Paper Prices

Word has recently been received in the United States that Scankraft, the European cartel of kraft paper producers, has raised prices on kraft papers by 15 per cent. Prices are now quoted in United States dollars converted to the pound at \$4.70. No prices are being quoted by members of Scankraft on orders that cannot be shipped within 30 days from receipt of the orders. The buyer must stand any increase in manufacturing cost that may arise between the time the order is received and the paper shipped.

Brinkley Company Now Representing Nash Engineering

• The James Brinkley Company of 417 Ninth Avenue South, Seattle, were appointed representatives in western Washington for the Nash Engineering Company of South Norwalk, Connecticut on

August 1st.

James F. Brinkley and Douglas C.

Morris of the James Brinkley Company
will sell and service the complete Nash
line of vacuum and centrifugal pumps
according to E. A. Mead, sales manager
of Nash Engineering, who made the announcement.

Both Mr. Brinkley and Mr. Morris are well known in the pulp and paper industry as materials conveying engineers, representatives of the Pulp Bleaching Company and other concerns manufacturing products for use by the pulp and paper industry.

In September Carlton L. Clark of the Nash Engineering sales department was in The Pacific Northwest working with Mr. Brinkley and Mr. Morris.

Chemurgic Conference in Seattle On November 4th

● The Washington State Chemurgic Conference will be held on Saturday, November 4th, in the auditorium of the Seattle Chamber of Commerce building at Third and Columbia in Seattle and on the program are three papers of definite interest to the pulp and paper industry.

dustry.

The conference is being sponsored by the Washington State Planning Council, the Washington State Grange and the Seattle Chamber of Commerce, "for the stimulation of research and development of new commodities from field and forest."

At the conference will be Dr. H. T. Herrick, in charge of Regional Laboratories of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, and Dr. T. L. Swenson, chief of the new Western Regional Laboratory, serving among others the state of Washington. This laboratory is now under construction at Albany. California, on San Francisco bay.

the state of Washington. This laboratory is now under construction at Albany, California, on San Francisco bay.

A Washington State Products Breakfast will start off the one day meeting at 8 a. m. At the breakfast Bernard T. Winiecki, chemical engineer of the Shelton Division of Rayonier Incorporated, will speak on "Agricultural Uses of Waste Liquor from Sulphite Pulp Mills," and Dr. Alan J. Bailey, acting director of lignin and cellulose research at the University of Washington, will talk on "Industrial Uses of Waste Liquor from Sulphite Pulp Mills."

Another paper of interest to the Park

Another paper of interest to the Pacific Northwest pulp and paper industry is "Hemlock Tannin Extract," which will be presented by Ralph W. Frey, senior chemist, Industrial Farm Products Division, Department of Agriculture, Washington, D. C.

Those desiring to attend should send reservations to Oliver S. Morris, secretary, 215 Columbia Street, Seattle, Washington.

Bartlett Visits Hooker Plant

● E. R. Bartlett, vice-president of the Hooker Electrochemical Company of Niagara Falls, New York, arrived in Tacoma on October 6th for a week's visit with Albert H. Hooker, Jr., western sales manager in charge of the company's Pacific Coast operations.

American Potash Opens Northwest Offices in Seattle

● The American Potash & Chemical Company, producers of Trona salt cake and other chemicals at Trona, California, recently opened new offices at 1024 Fourth Avenue South, Seattle, in conjunction with their selling representatives, Wilson & Geo. Meyer & Company whose headquarters are in San Francisco.

Frederic M. Pape is manager in charge of the Northwest office.

Sid Drew and John Hoffman Establish New Firm

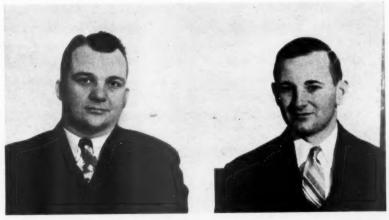
• The formation of a new company to serve the pulp and paper and related industries, known as Drew & Hoffman, has been announced by two well known figures among the industry's allied trades, E. G. Drew and J. G. Hoffman, Jr. Prior to the organization of the new

Prior to the organization of the new concern, these two men had for some years represented the J. O. Ross Engineering Corporation on the Coast, making many important installations in pulp and paper mills of the West. Mr. Drew opened western activities for Ross 12 years ago, after spending four years in the Chicago engineering department. Mr. Hoffman has specialized in industrial heating and ventilating during the past four years with the Ross organization. The two bring to the new partnership a long combined experience and training in the problems peculiar to pulp and paper.

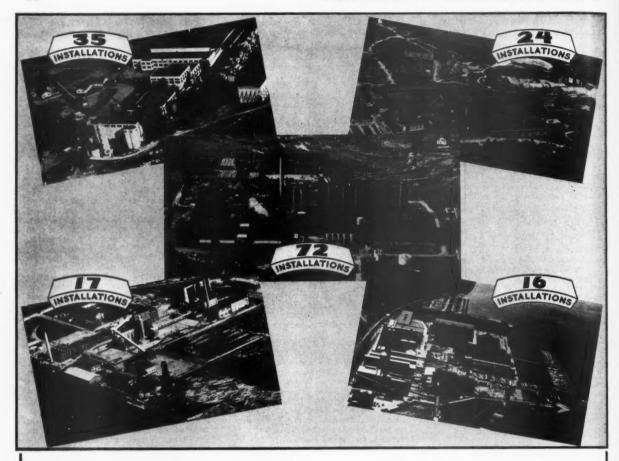
Drew and Hoffman will continue to provide the industry with technical advice and equipment necessary to assure proper ventilating, drying and working conditions throughout the paper mill. In addition to this, they will continue to handle the patented lines of the J. O. Ross Engineering Corporation, including the Ross Grewin system.

The new company will act as sales agents in Washington and Oregon for the Foster Wheeler Corporation, who manufacture a complete line of power plant equipment, and in Oregon for the Centrifix Corporation, makers of steam, air and gas purifiers.

Headquarters have been established at 521 Railway Exchange Bldg., Portland, where the telephone number is BEacon 1667.



E. G. (Sid) DREW and JOHN R. HOFFMAN of Portland who have established a partnership as Drew & Hoffman to conduct an engineering business in heating, ventilating and air conditioning for pulp and paper mills.



A TOTAL OF 164 STEBBINS LININGS IN 5 PLANTS IS PROOF POSITIVE OF THE SATISFACTION THEY GIVE

Stebbins Acid and Corrosion-Resisting Linings for a wide variety of vessels and tanks are in use in a large majority of the leading pulp and paper mills on the North American continent. In some mills only a few Stebbins Linings are installed, while in others Stebbins Linings are used practically exclusively and it is significant to note that over 90% of all the sulphite digesters in the country are Stebbins lined.

In the five West Coast plants shown above, a

total of 164 Stebbins Linings are installed and the number is constantly increasing. This is convincing evidence of the superiority of Stebbins Linings and the long, efficient, economical and trouble-free service their use assures.

Stebbins engineers—equipped with this diversified lining experience—are always at your service to help solve any of your lining problems. There is no obligation whatsoever attached to a consultation with a Stebbins engineer.

SEMCO

Stebbins Engineering Corporation

TEXTILE TOWER

SEATTLE, WASHINGTON

Eight Months Pulp Imports Up 10.68% Over 1938

• Imports of wood pulp, all grades, into the United States in the first eight months of 1939 amounted to 1,141,530 short tons as compared with 1,031,341 short tons imported in the same period of 1938. The increase was 110,189 short

of 1938. The increase was 110,189 snort tons or 10.68 per cent.

Imports of chemical wood pulp in the first eight months of the current year totalled 1,011,641 short tons as comtotalled 1,011,641 short tons as compared with 929,070 short tons in the similar 1938 period, a gain of 82,571 short tons or 8.8 per cent.

Imports of groundwood pulp for the first eight months of 1939 amounted to 103,089,080 short tons on 1939 amounted to 103,089,080 short tons 1939 amounted to 1930 september 1930 sept

129,889 short tons against 102,271 short tons in the 1938 period, a gain of 27,618 short tons or 27 per cent.

August Pulp Exports Nearly 11,000 Tons

· Wood pulp exports from the United who wood pulp exports from the United States in August amounted to 10,946 short tons of all grades with a declared value of \$490,597. In August a year aso the exports were 5,116 short tons, valued at \$215,549. In July of this year the pulp exports amounted to 11,030 short tons valued at \$50,652

tons valued at \$569,652.

Exports of wood pulp from the United States for the first eight months of totaled 61,462 short tons valued at \$2,804,248 as compared with exports of 83,906 short tons valued at \$5,407,870 in the same period of 1938.

August wood pulp exports consisted of 4,205 short tons of rayon and special chemical grades valued at \$279,018; 610 short tons of other bleached sulphite valued at \$33,160; 3,377 short tons of unbleached sulphite worth \$95,960; 598 tons of soda pulp valued at \$27,259; 1,767 short tons of unbleached sulphate valued at \$47,338, and 389 short tons of other pulp valued at \$7,862.

WoodPulp Added to German Contraband List

· After one Swedish and one Finnish ship carrying wood pulp to England had been sunk in the Baltic Sea by German submarines, it was announced over the short wave radio from Berlin on September 26th that wood pulp was contraband.

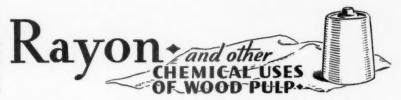
The announcement stated that since wood pulp could be turned into nitrocellulose for the manufacture of munitions, it was legitimately contraband. The modities, issued on September 18th, did not list wood pulp.

K. O. Fosse Is a Grandfather

K. O. Fosse, president of the Coos Bay Pulp Corporation at Empire, Oregon, entered into the select company of grandfathers in September upon the birth of a son to his daughter, Mrs. Jerry Robin-

Darby Doing P. G. Work At Stanford

 James Darby of the Crown Willamette technical department at Camas, has gone to Leland Stanford University at Palo Alto, Calif., for post graduate work. He graduated from Oregon State College in 1938 and since that time has been tester and laboratory assistant at Camas.



Rayon Yarn Stocks Very Low—Price Increased

• "We may describe the present stocks of textile raw materials in terms of rela-tive demand for them," says the Rayon Organon in its October issue. "Stocks of cotton are very high. Available stocks of wool are adequate to low. Silk stocks are adequate. Both the rayon filament yarn

and the rayon staple fiber stocks in the hands of producers are very low."
"Effective September 20th," the Rayon Organon continues," the largest viscose process rayon producer announced an increase in list prices of from 2 to 3 cents

per pound. . . .
"The prices of acetate rayon yarn also were increased by this producer as of September 20th. The advances here also amounted to 2 or 3 cents per pound, depending upon the denier of the yarn in-

"These price advances are character-ized by their moderateness when compared with wool and silk price advances during September. The price of rayon staple fiber was unchanged as of October 3rd.

Imports of Rayon Staple Fiber

• "Imports of rayon staple fiber during August totaled 3,390,000 pounds, which represented a small decline from the July level," says the Rayon Organon. "Imports for the first eight months of this year have amounted to 27,860,000 pounds compared with 13,189,000 pounds in the same 1938 period, or an increase of 111

per cent.
"It is understood that the rate of staple fiber imports will be maintained or increased during the remaining months of 1939, assuming, among other things, that Italy remains neutral and that there is no apperciable interruption in shipping from Great Britain and Italy especially. September imports are understood to be below these August figures, but this is believed to be a temporary situation.

Japan's Rayon and Staple Fiber Production and Exports

• The following report of the rayon and staple fiber situation in Japan was issued by the Bureau of Foreign & Domestic Commerce, United States Department of Commerce, on September 30th.

"Production of rayon yarn in Japan during the first half of 1939 totaled 112,-579,500 pounds, compared with 120,-637,000 in the corresponding 6 months of 1938, according to reports of the Japan Rayon Producers' Association. (These figures are said to relate only to production by the viscose process. Since June 1, 1938, rayon production has been restricted to about one-third of the industry's capacity). Rayon-yarn production during July amounted to 19,600,000 pounds, about 1,177,000 less than in the preceding month, but an increase of more than 5,000,000 pounds over the output of 14,323,000 pounds in July, 1938.

"The output of staple fiber during the first 6 months of 1939 in Japan was reported as 132,648,000 pounds, as compared with 168,732,000 in the corresponding half of 1938, a decline of 21 per cent, attributed mainly to the shortage of pulp for the manufacture of staple fiber. Last year Japan's staple fiber production was used mostly by the domestic textile industry as a substitute for imported cotton and wool. In order to conserve foreign exchange, the Japanese government has imposed various restric-tions on the importation of foreign cotton and wool since the latter part of 1937.

Exports of staple fiber in the first half of 1938 totaled only 125,400 kin (valued at 92,000 yen), but during the first 6 months of 1939 they rose to 7,641,700 6 months of 1939 they rose to 7,641,700 kin (7,206,000 yen). Staple-fiber yarns were exported to the amount of 3,561,600 kin (4,330,000 yen) in the first half of 1938 and 3,088,300 kin (4,246,000 yen) in January-June, 1939, while exports of 'tissues of staple fiber (including mixed tissues)' rose from 17,045,000 square yards (6,666,000 yen) to 30,917,000 square yards (17,227,000 yen) in the 1939 half year. Exports of staple fiber and 'tissues' thereof go mainly to the yen-bloomers (Manchuria Kwapzung Lexaed Tor sues' thereof go mainly to the yen-bloc areas (Manchuria, Kwantung Leased Ter-ritory, and North China), but shipments of staple-fiber yarn to such markets in the 1939 half year represented only about 8 per cent of the total volume, while exports to British India and the Netherlands Indies combined accounted for 85 per cent of the total quantity exported.

Exports of rayon yarn during the first half of 1939 totaled 11,358,600 kin valued at 11,412,000 yen, compared with 7,615,800 kin (7,503,000 yen) in January-June, 1938, a gain of 49 per cent in quantity and of 52 per cent in value. More than half of the rayon yarn exports went to British India in the 1939 half year (5,782,600 kin valued at 5,432. half year (5,782,600 kin valued at 5,432, 000 yen); China ranked second with takings of 1,331,300 kin (1,923,000 yen), takings of 1,331,300 kin (1,923,000 yen), followed by Mexico with 947,300 kin (807,000 yen), and Australia 249,100 kin (280,000 yen). Kin = 1.3228 pounds; exchange value of Japanese yen approximated \$0.29 in the first 6 months of 1938 and \$0.2727 in January-June, 1930) 1939).

"Rayon and rayon-mxed 'tissues' (piece goods) were exported from Japan to the amount of 149,145,000 square yards (valued at 62,149,000 yen) during the first half of 1939, a decline in quantity but an increase in value compared with shipments in the corresponding period of 1938 (172,335,000 square yards valued at 54,478,000 yen). About one-third of these exports, from the standpoint of square yardage, went to Manchuria, Kwantung Province, and China whose combined takings aggregated 48,180,000 square yards valued at 27,485,000 yen. Among the 'foreign currency countries' the leading markets were British India 20,737,000 square yards, Australia 20,241,000, Netherlands Indies 13,746,000, Hong Kong 6,645,000, and the Union of amount of 149,145,000 square yards (val-Hong Kong 6,645,000, and the Union of South Africa 3,906,000."

Proper and Safe Handling of Chlorine and Caustic Soda in Tank Cars

by BRIAN L. SHERA*

HLORINE has been termed "The Green Goddess," perhaps because of its value to man in his industrial processes and in protecting his water supplies; but she will inflict a merciless vengeance on those who do not respect her power. She will swiftly smite the careless and the thoughtless.

In order to handle chlorine properly and safely, it is well to consider the pertinent characteristics and behavior of this chemical.

Physical Characteristics

(a) Chlorine is a heavy, greenish gas at atmospheric pressure. Under moderate pressure, at ordinary climatic temperatures, it will exist as a heavy, orange-colored liquid.

(b) Chlorine gas at ordinary temperature is not corrosive to metals, but in the presence of moisture it is exceedingly destructive to nearly all metals.

- (c) Moist chlorine gas will not attack glass nor chemical stoneware, and, in the cool state, but slightly attack hard rubber and certain synthetic materials, silver and Hastelloy C. Lead is often used, but suffers appreciable corrosion.
- (d) The cubical coefficient of expansion of liquid chlorine is relatively high.
- (e) Chlorine has a low viscosity in either gaseous or liquid phases.
- (f) Chlorine is very irritating to the mucous membranes and

The above characteristics would lead one to assume that this chemical could be kept confined in the dry state by equipment designed for moderate pressures and allowing space for liquid expansion. Also that men should not be exposed to it due to carelessness which would permit use of weak and faulty equipment. It is also apparent that moisture should be kept away from chlorine except in equipment designed to re-

sist chlorinous acids. Every effort should be made to confine chlorine to its containers and not risk damage to man and materials

Container Specifications

The shipment and handling of chlorine are well standardized and one rarely hears of accidents to tank cars. Several manufacturers of chlorine and chlorine handling equipment formed The Chlorine Institute, Incorporated, which is used as a clearing house to promote safety, and improvements in containers and appurtenances. Investigations are conducted by appointed committees. During the last two years active research has found better steel to use on tank car valves; designed an improved safety valve; standardized gasket materials; improved the material and methods of making fusible plugs.

Certain committee reports are presented by the Chlorine Institute to the Interstate Commerce Commission with a plea for favorable action. Chlorine shipments are regulated by the ICC and all equipment for its transportation must conform to the regulations of this body.

There are two sizes of single unit tank cars, 16 and 30 tons capacity, specified as the ICC 105-A type. The older cars were tested to 300 pounds pressure and the newer cars are tested to 500 pounds pressure (see tank car sketch). The inner shell, made of open hearth boiler-plate steel of flange quality for forge welding, varies from 3/4" to 1" thickness, depending on the size of car and the year of construction. This pressure vessel is covered with four inches of cork insulation, which in turn is jacketed with the 1/8" steel outer shell to protect the insulation from the elements. The tank is provided with a dome centrally located at the top of the car. Located within the dome are: one spring loaded safety valve, two gas discharge valves (transverse to car), and two liquid eduction valves (longitudinal to car). Each liquid valve is connected to the bottom of the car by means of an eduction pipe equipped with a ball check valve which seats and stops the flow of liquid in case of excessive withdrawal, breakage of valve, or rupture of unloading line.

The chlorine manufacturers follow the prescribed regulations of the Interstate Commerce Commission in the maintenance of their equipment. At intervals of two years, or less, the tank and all appurtenances are hydrostatically tested to the prescribed pressures of thirty minutes (see tank car sketch). In addition to the required tests all valves are reconditioned after each trip in order to insure positive operation. The running gear, tank car shell, etc., are thoroughly checked before shipment. A moisture determination is made of the gas returned in the car. The test information and dates are stencilled plainly on each

Shipping Regulations

● No shipment may be made of a leaking or defective car, all valves must be closed; caps, plugs, covers, etc., must be fastened securely in their proper places. Placards are placed on each side and each outside end of car carrying this information "COMPRESSED GAS-LIQ-UID CHLORINE." Rule 226 of the Bureau of Explosives requires that the party unloading the tank cars remove the placards before returning the empty car.

Unloading Tank Cars

● Cars must be unloaded only on a protected, private track of the consumer. Where possible a track should be provided solely for the unloading of chlorine. When chlorine is being unloaded on a siding used for other purposes, derails should be placed at a reasonable distance from each end of the car and signs in large letters posted bearing the words "STOP — CHLORINE CAR CONNECT-ED." Red lights or lanterns should be provided at night at each end of the car.

Unloading the car and making or breaking connections should be made in well-lighted places. The car should be connected to the permanent piping by means of an S shaped ¾-in. or 1-in. coil of heavy annealed copper tubing for 500 lb. per sq. in. working pressure.

^{*}Service Engineer, Pennsylvania Salt Manufacturing Company of Washington, Tacoma, Washington. Presented at the Dinner Meeting sponsored by the Pacific Section of TAPPI held at the Hotel Edmond Meany, Seattle, Washington, on October 3, 1939.

Reliable and instructed persons only, should make up connections or unload the tank cars. The tank car valve must be closed, when unloading operations cease, and the liquid chlorine drained from the piping between the car valve and the first valve in the line, which should be located as near the car as possible.

The tank car dome lid should be kept closed at all times when no work is being done in the dome and the lid must not be allowed to slam shut because such severe jars may unseat the safety valve.

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Piping Chlorine

 Since chlorine has such a low viscosity, it requires a first class piping job to hold it, and its corrosiveness is such that a leak will not stop by itself, but only grow worse. Extra heavy piping is essential and the fittings and pipes should have clean, sharp, well-formed threads. For a permanent installation, a pipe dope of litharge and glycerine is found best. This should be well mixed to a thick, creamy consistency and should be applied only to the male threads and not allowed inside the pipe or fittings. Welding of chlorine lines is meeting widespread favor. The two pieces should be held closely together to prevent molten metal from flowing to the interior of the pipe and restricting flow.

No welding is to be made on equipment containing chlorine gas or liquid. The heat generated by the welding action will cause the iron and chlorine to unite and form brittle ferric chloride. On flanged fittings only chlorine resistant gaskets should be used. Lead with 2-6 per cent antimony, Garlock 900, or equal, have been found suitable for chlorine service. Rubber, in any form, must be avoided. The pipe and fittings before assembly should be free of foreign matter, which can be removed by steaming and blow-ing out with dry air. No moisture should be allowed in a chlorine line at any time as corrosion is rapid and the ferric chloride formed may clog meters or discolor the bleached product. If gaseous chloride is desired the pipe line should be run on a rising gradient from the liquid container in order to prevent any condensed liquid chlorine from reaching the gas control apparatus. On new or repaired pipe lines or containers, chlorine gas should be used first to test for leaks instead of the liquid, because the latter gives an unnecessarily large volume to be removed in case the pipes or containers are not tight.

On liquid chlorine lines, it is well to provide an expansion chamber as an additional safety factor. An inverted 100 or 150 lb. chlorine cylinder placed above the highest point in the line will provide a suitable expansion chamber. Liquid chlorine should not be trapped between valves in a pipe line without an expansion chamber because rising temperatures will create hydrostatic pressures potentially in excess of the designed strength of the equipment. Valves of approved design for chlorine are safer and found the best in handling chlorine. They should have wide and deep chlorine packing, a stem of suitable diameter to give strength and an outside screw and voke.

Chlorine manufacturers should be consulted in running new lines or in making radical piping changes as their engineering or service departments are trained for this work.

Chlorine Leaks

• Chlorine leaks can be readily detected by use of aqua ammonia. A blow bottle leak tester is found to be best for this work. It can be made from a wide mouth 8 oz. bottle fitted with a two-hole stopper. An atomizer bulb is connected to a tube leading through one hole of the stopper. Another tube, tapered to a pointed outlet, leads from the other stopper hole. Air blown onto the surface of the aqua ammonia will carry ammonia fumes out the pointed outlet tube. The leak can be quickly found by directing the flow of ammonia fumes in the direction of the suspected leak. The reaction of chlorine and ammonia produces dense white fumes.

The first rule to observe after locating a leak is to shut the container valves in order to stop the chlorine flow from the leaking pipe, valve, fiitting, evaporator, etc. line should be drained of chlorine, either into the plant process or to the outside provided it will not endanger or inconvenience persons or property. In some cases there may be a large enough sewer flow to absorb the chlorine. Another convenient means is to absorb it in barrels of water to which 10 to 15 lbs. of lime have been added. 11/4 lbs. hydrated lime will be required for each 1 lb. of chlorine absorbed. No welding or other heating should be performed on chlorine lines or auxiliary equipment while containing chlorine gas or liquid. It is known that temperatures up to 250° F. are safe in not promoting chemical ac-tion between steel and chlorine, provided the latter is absolutely anhydrous.

General Accident Information

· Stopping Leaks. If the leak is found in the consumer's pipe lines or equipment, it may be quickly stopped by closing tightly the chlorine container valve and the consumer's auxiliary valves. All chlorine container valves close clockwise. If the leak is found to be in the container, steps should immediately be taken to correct it. Delays are dangerous since chlorine leaks will not take up but will get progressively worse. The leaking container should first be moved to the outside air or, in the case of a tank car, to the point on the consumer's private tracks where it will do the least harm. Leaking containers will not be accepted by railroads or other carriers for shipment. Valve stem leaks may be stopped by tightening packing connections. Other container leaks may usually be stopped by using good judgment. All leaks may be lessened by lowering the pres-sure of the container. This is best accomplished by withdrawing chlorine gas from the container as rapidly as conditions permit.

In case of a serious equipment leak or any trouble encountered with a tank car in the nature of leaks, broken or defective running gear, valves, etc., the car owner or the nearest chlorine manufacturer should be called.

The cause of the trouble should be carefully observed and described to the manufacturer, who will furnish instructions to remedy the situation or dispatch well-trained serv-



BRIAN L. SHERA, Safe Handling of Chlorine and Caustic Soda.

ice men to cope with the problem. Fortunately, the rigid inspection to which tank cars are subjected at the manufacturer's plants limits tank car leaks to very rare instances. Chlorine users should encourage and train responsible men to handle their chlorine problems, and ask the chlorine manufacturers to aid in training the men for routine duties and for emergency work.

Employee Protection

 Provide physical examination, including X-Ray, of applicants for employment and of employes handling chlorine.

Every person whose duties may cause exposure to chlorine should be provided with a gas mask of a design approved by the United States Bureau of Mines for chlorine service. Each person should have his own gas mask and understand thoroughly how to wear it, how to replace canisters, how to keep it in order and should always follow instructions furnished with the mask. A bad gas mask is worse than no gas mask.

Additional gas masks in perfect order should be available at selected places in the plant away from the immediate point of use of chlorine, so that in the event of accident, other gas masks are also available.

When the odor of chlorine indicates a leak, the persons authorized to act in an emergency and equipped with gas masks should investigate. All other persons should leave the affected area. Hold drills at frequent intervals.

What to Do When Human Beings Are Injured With Chlorine

 Carry patient from gas area. Patient should preferably be kept in a room at about 70° F. Supply blankets if necessary. Keep patient warm and quiet. Rest is essential. Place patient on back with head and back elevated.

Call the physician immediately. Splashes of liquid chlorine and chlorinated water destroy clothing, and if such clothing is next to the skin it will provide irritation and acid burns; in such cases remove clothes and keep patient warm with blankets.

Milk may be given in mild cases as a relief from throat irritation.

If breathing has apparently ceased, start immediately the artificial prone pressure method of re-suscitation. (Shafer). Do not exceed 18 movements per minute.

Provide first aid as may have been prescribed for emergencies by your company physician pending his ar-

Caustic Soda

• The speaker recommends that ail buyers of tank car Caustic Soda obtain Manual Sheet TC-3 of the Manufacturing Chemists Associa-tion of the United States, 608 Woodward Building, Washington, D. C. This may be ordered for 10c. or from the caustic soda manufacturers. The speaker can add nothing of value to this bulletin.

Summary

• The speaker has found that chlorine and caustic soda tank car users in the Northwest generally follow a safe practice in handling these chemicals and in maintenance of the handling equipment. All users of chlorine utilize the S shaped annealed copper flexible connection and 3/4 in. or 1 in. extra heavy iron pipe. Not all of the valves in use are of the best design for chlorine service. Some have stems too small in diameter and packing chambers too narrow and inaccessible.

The users are in all cases well equipped with gas masks for all personnel handling chlorine. Two users to the speaker's knowledge are equipped with oxygen masks to deal with a major catastrophe wherein canister masks would not suffice. In general the personnel handling the tank cars and maintaining the clorine equipment is conscientous and efficient

The speaker's suggestions to Northwest users to further the safety and ease of handling chlorine and caustic soda are:

- (1) That greater care be observed to prevent moisture entering the flexible connections and ends of chlorine pipe lines while tank cars are changed or disconnected. Rubber stoppers should be inserted immediately in the open ends of any pipe disconnected. Better protection should be afforded to valves exposed to the weather. At least one gallon tin cans should be inverted over the valves to keep off rain.
- (2) A better choice of valves could be made. The O. S. & Y. type with large diameter stem and wide, deep packing chamber are preferred. Ordinarily flanged valves are more suitable to the maintenance men due to ease of replacement. Stems of Monel metal or Hastelloy C will greatly resist the corrosion encountered on the stems from the minute quantity of chlorine that seeps by

the packing. An extra supply of valves should be kept in a state of repair in the storeroom.

(3) Through experience some users have found time saved by delegating one man to make an inspection of all chlorine valves at the start of work each morning. Valves should turn freely and seat easily without leaking. Periodic use of new packing should not be stinted. Properly operating valves will aid in continuous operation and save the time and temper of the operators.

(4) Users of chlorine evaporators should take means of protecting this equipment against excessive pressure which might result from heating trapped liquid chlorine in the evaporator while out of use. The installation of a rupture disc

is favored.

(5) On caustic soda the men unloading the tank cars should be more careful to wear goggles and rubber gloves as a caustic burn can be very serious.

Rayonier Operations **Broadcast From Hoquiam**

• Operations of the Grays Harbor Division of Rayonier Incorporated were broadcast over station KJR of Seattle on Wednesday, October 4th. The various wednesday, October 4th. The various steps in manufacturing, dissolving wood pulp were described as the feature of the Washington at Work program which is sponsored by the Puget Sound Power & Light Company. William E. Breitenbach, chief chemist

of the Hoquiam plant, answered the ques-

tions of the announcer.

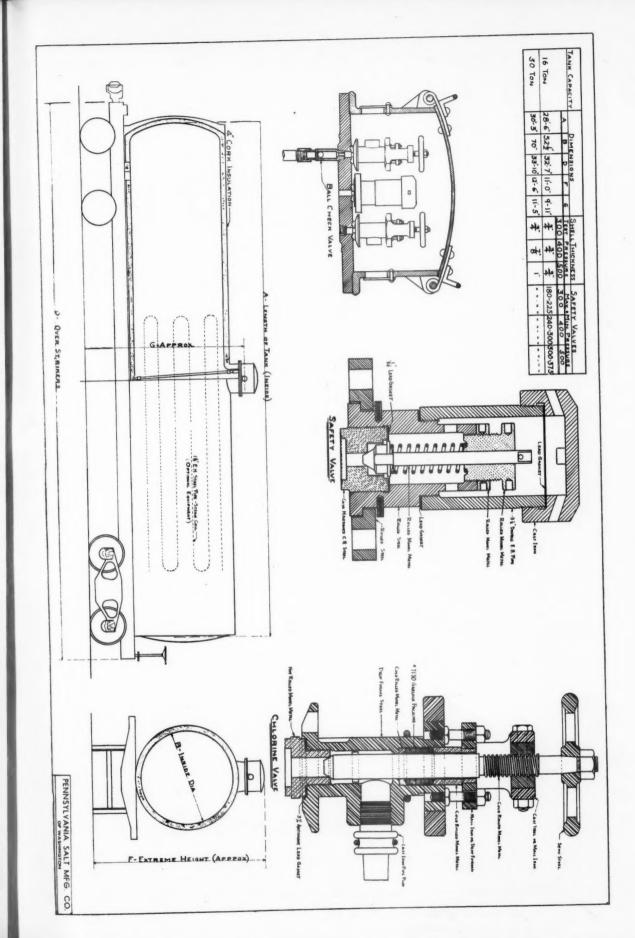
Pulp Stocks Gain \$40,000,000 in Value

• The Associated Press sharpened its pencil the first of October and did some figuring, coming up with the announce-ment that Pacific Coast pulp and paper stocks had gained approximately \$40,000,000 in value from September 1st to October 1st. Said the Associated Press:

"The seven stocks of four companies in that industry, listed on the San Francisco stock exchange, gave that market its biggest moments. Gains in prices for the seven ranged from 3 to 183 per cent, and averaged 46 per cent to top all other

groups on the exchange.
"The month, incidentally, added \$870,-935,754 to the market value of stocks listed on the exchange, and hoisted the aggregate value to \$6,132,699,704. month's appreciation was 16.55 per cent.

"Two of the seven pulp and paper Two of the seven pulp and paper stocks placed in the exchange's list of 10 most active issues. They were Crown Zellerbach common stock, with 62,671 shares traded on a range from 9½ to 16½, finishing up 11 points at 15½ for a 69 per cent gain, and Soundview Pulp, with 39,124 shares traded, ranging from 12½ to 29, finishing up 12% at 25% for a gain of 103 per cent. Puget Sound Pulp rose 183 per cent, finishing at 10¼ after ranging from 4¼ to 11%."



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SULPHUR

Important Thermal **Properties**



Heat of Combustion

2,212 cal./gm.

Heat of Fusion

115°C. 119°C.

9.3 cal./gm. 13.2 cal./gm.

Heat of Reaction

 $S \text{ (rhombic)} + O_2 \text{ (gas)} = SO_2 \text{ (gas)};$

(25°C.) 70,916 cal.

 $SO_2 (gas) + \frac{1}{2} O_2 (gas) = SO_3 (gas);$ (25°C.) 22,600 cal. S (rhombic) + 2 O2 (gas) + H2 (gas) + aq. = H2SO4 aq; (25°C.) 211,626 cal.

Heat of Transformation

S (rhombic) - S (mono.) 96°C. 0.086 K. cal./gm. atom

Heat of Vaporization

120°C. 444.6°C.

84.8 cal./gm. 69.5 cal./gm.

Ignition Temperature

approx. 261°C.

Specific Heat

0.175 cal./gm.

Rhombic 0° to 95°C. Liquid 115° to 160°C.

0.220 cal./gm.

Mines: Newgulf and Long Point, Texas

B. C. Shipping Situation Is Improving

· Anxiety shared by British Columbia pulp and paper exporters as a result of war and the seemingly inevitable shortage of ship tonnage has been relieved somewhat during the past few weeks. It has

what during the past few weeks. It has become apparent that, unless conditions change drastically within the next few months, shipping schedules will not be greatly interrupted.

There has been some dislocation, of course, as a result of the commandeering of all British deep-sea ships, the diversion of some vessels from the Pacific Newburgt to extra results and the re-Northwest to other routes, and the re-luctance of some neutral shipowners to operate their vessels in the war zone, but the situation is not nearly so bad as had been feared. Exporters state that, so far, they have not experienced delay in making their deliveries except in a few ex-

ceptional instances.

The period of uncertainty was ended The period of uncertainty was ended when the British shipping board, working in co-operation with the timber controller, announced that ships would be made available for British Columbia's lumber trade with the United Kingdom. The lumbermen had been more jittery than any other exporting group as a sudden withdrawal of ships would have resulted in virtual collapse of 90 per cent of their trade. The British Isles have been taking delivery of more than 100,000,000 feet of lumber per month lately, 000,000 feet of lumber per month lately, which accounts for nearly all the waterborne export.

While exact figures relating to tonnage available have not been revealed, it is understood that all the ships necessary will be provided and that the lumber will be taken on an F.A.S. basis. This is taken to mean not only that the lumber situation is being taken care of, but that there is nothing serious to worry about regarding pulp and paper and other shipments

to offshore markets.

Unlike lumber, which is a costly freight when shipped by means other than the water haul over long distances, pulp and paper can be shipped across the continent by rail and some consignments have already been filled that way; but wherever possible, the industry will rely

Brown Instrument Issue Boiler Room Instrument Booklet

 Boiler Room Instruments is the title of a new booklet issued by The Brown Instrument Company of Philadelphia.
 Its purpose is to provide data from which a suitable plan of instrument equipment, covering most operating needs, may be easily worked out for any steam plant.

Feedwater temperature, saturated steam flow, and per cent CO2 tables point out the possibilities in fuel saving, the primary object of improved boiler room efficiency. Steam generation and distribution applications for measuring temperature, pressure, flow, liquid level and per cent CO₂ are illustrated and described.

scribed.

Copies of the new booklet may be obtained from The Brown Instrument Company, Wayne and Roberts Avenues, Philadelphia, Pa., by asking for Booklet No. 29-31, or copies may be secured from The Control Equipment Company, Selling Building, Portland, Oregon, or Terminal Sales Building, Seattle.

Boyce Resigns as Secretary Of American Paper & **Pulp Association**

• Charles W. Boyce, executive secre-tary of the American Paper & Pulp Association since 1932, and a member of the staff since 1928, tendered his resignation in September to become effective after the annual meeting in February 1940.

Mr. Boyce will become vice-president of the Northwest Paper Company of

Cloquet, Minnesota.

In accepting his resignation the Executive Committee of the association stated that they did so with mixed feelings-regret over the loss of so capable an executive and sincere wishes for his suc-

cess in his new position.

Mr. Boyce was with the U. S. Forest Service for a number of years and dur-ing that period became familiar with the timber resources of the Pacific Northwest and Alaska. While with the Forest Service Mr. Boyce was the author of several bulletins including "How the United States Can Meet its Present and Future Pulpwood Requirements," of which he was co-author with Earle H.

Poetry Permits Painless Extraction of Two Bits

 The Central Technical Department of the Crown Zellerbach Corporation at Camas, Washington has a fund for wedding presents, flowers, etc., to which members of the department voluntarily coentribute twenty-five cents monthly.

Louise Baxter is in charge of the fund and the collections. Miss Baxter has found that the two bits a month can be painlessly extracted by humorous poetry such as the following which recently appeared on the department's bulletin board.

At noon ask your wife for a quarter, Which is just the same as two bits, And if I have trouble collecting,

I am going to throw one of my fits!"

Ocean Falls Girls **Vacation in States**

 Miss Pat Wilson and Miss Velma
 Walters of the Pacific Mills, Limited staff at Ocean Falls, B. C., were visiting friends in Seattle and Portland the mid-

dle of October while on vacation.

Miss Wilson is secretary to Frank R.

Drumb, resident manager at Ocean Falls, and Miss Walters is in the sales and

order department.

Doris Butterick to Marry Jack Robertson

• The post of reception clerk and telephone operator in the Portland offices of the Crown Zellerbach Corporation seems to be one which receives special attention from Dan Cupid.

Last year Connie Butterick left the job to become a housewife, and her place was taken by her attractive sister Doris.

Now it is learned that Doris Butterick has given up the post to become the bride of Jack Robertson, safety super-visor for the Crown Willamette mill at Camas, Washington.

However, the company appears to be However, the company appears to be able to maintain the standard of quality. The new reception clerk and telephone operator is Miss Virginia Gault, daughter of Vic Gault at the Camas plant.

Camas Paper School Starting October 24th

The Crown Willamette Paper School will start its seventh season at Camas, Washington, when fall classes start Oc-

The curriculum this year will be substantially the same as heretofore, but with some improvements through modification of lectures, etc. A new feature will be the use of moving pictures taken in the plant, to illustrate various activities to the students. The printed books which have been under preparation for some time, containing material on all phases of the business, are expected to be ready for use when the first classes start.

The company is preparing a large assembly hall in the McMaster Building in Camas, which will be used for the paper school, first aid classes, foremen's meet-The new hall will seat some ings, etc.

200 persons.

The faculty of the school will be the same as last year, except that Wilbur Harms of the technical department will act as registrar, replacing Millard Raw-lings who has gone to the sales depart-ment in San Francisco.

The company's first aid classes will start October 17. About 100 to 150 employees will be trained this year. When registration was opened, the classes were filled in the first three or four hours, indicating the interest the men take in

the work.

About 600 of the mill employees have already completed the first aid courses.

Berk Bannans Celebrate Arrival of Phillip III

On September 14th Phillip Bannan, Mrs. Berk A. Bannan in Seattle. The youngster was named after his grandfather who is president of the Western Gear Works and of the Pacific Gear & Tool Works of San Francisco, and also after his uncle Phillip Bannan, manager of the company's plant in Los Angeles.

Berk Bannan, secretary-treasurer of the Western Gear Works in Seattle, is well known in the pulp and paper in

Al Hooker Awarded The Purple Heart

● Albert H. Hooker, Jr. of Tacoma, major in the U. S. Army Reserve received in September the award of the Purple Heart for Military Merit. This is a distinguished honor, originating with George Washington during the War of the Revolution and re-established by congressional action in 1933.

In his award of the medal, the secre-

In his award of the medal, the secretary of war directed that it be given to Major Hooker "In recognition of wounds received from shell fragments in action with the enemy at Dieckebusch sector in Belgium on August 23, 1918, 21 years ago." At that time Major Hooker was

ago." At that time inajor riooker was a first lieutenant and gas officer for the 27th Division, A. E. F. He was previously awarded a victory medal, a silver star with four bars for participation in extensive military engagements in the Somme, Ypres and Lys sectors. He also has the Conspicuous Service cross for exceptional courage under machine gun fire.

Major Hooker is western sales man-ager of the Hooker Electrochemical Company in Tacoma and is active in civic and military affairs.

Pulpwood Utilization Trends In the North Pacific Region

Analysis of Total Log Sales of Pulp Species Shows That in 1929 3.5% Were for Pulp Wood – In 1934 the Percentage Had Risen to 64%

by HERMAN M. JOHNSON*

HE pulp and paper industry of North Pacific region began with the establishment of a small mill near Oregon City in 1866, using rags and straw for pulp. In 1885 this mill was moved to Camas, Washington, the present site of one of the world's largest pulp and paper mills, and became the first groundwood mill in the region. Oregon's first groundwood mill was built at Young's River Falls, near Astoria, a year later. From this small beginning the pulp and paper industry has developed into one of the major industries of the region. At the present time there are 26 establishments in western Oregon and western Washington, consuming annually nearly 2,000,000 cords of pulpwood.

Since the establishment of the first groundwood mill, pulpwood in log form has with minor exceptions been the chief source of raw material in this region. With lumbering the major industry this is the natural consequence. Forest wood (cordwood) and mill waste have always supplemented logs, the proportion of these forms being dependent upon economic conditions within the

lumbering industry.

Previous to and immediately following the World War about 90 per cent of the pulpwood requirements were purchased as logs. The effect of the 1921 depression with its resultant wage decreases and increased unemployment was evident in increased purchases of forest wood, so that by 1925 wood in this form comprised about one third of the requirements.

During 1922 hemlock lumber production started its rapid climb toward the 1928 peak. Coincident with this increase large quantities of mill waste suitable for pulp became available. During the period 1925 to 1930 there was great activity in pulp mill construction, the number of mills increasing from 10 to 23. The greater portion of this new construction was predicated upon the utilization of sawmill waste, particularly in Washington. In 1930 this

supplied about one third of the wood requirements, the forest wood decreasing to about one fifth and logs decreasing to less than one half.

During the depression years the pulp mills dependent largely on sawmill waste were forced to turn to forest wood and logs, because of marked curtailment in lumber production from pulp species. mills endeavored to meet the shortage of raw material with forest wood only because they did not have equipment for breaking down This source of supply soon proved inadequate. As a result many mills either installed equipment for reducing logs to cants of suitable size for the grinders or contracted such breakdown to nearby sawmills. By 1934 sawmill waste provided less than one tenth of the requirements, while logs used had increased until they made up two thirds; there was little change in the proportion of forest wood used.

• A further indication of the general trend toward logs as a source of pulpwood is brought out by Steer's analysis of log sales² in this region over a period of years. This analysis shows that of the total log sales of the pulp species (western hemlock, Sitka spruce, and the white firs) in 1929, 3.5 per cent were for pulpwood; in 1930, 25 per cent; in 1931, 17 per cent; in 1932, 46 per cent; in 1933, 51 per cent, and in 1934, 64 per cent.

Western hemlock has always been the predominant pulp species in this region, forming about three quarters of the pulpwood used. The proportions of pulp species in representative years are shown in the following tabulation:

Although in the past considerable changes have occurred in the form and species of the industry's wood requirements, it may reasonably be assumed that they have become fairly well established in this respect. On the basis of past trends and present performance, it is approximated that under normal operating conditions 70 per cent of their requirements will be received in log form, 20 per cent as forest wood, and 10 per cent as sawmill waste. Species requirements will approximate 76 per cent hemlock, 10 per cent white fir, 7 per cent Sitka spruce, 6 per cent Douglas fir, and 1 per cent miscallaneous species. Future installations will no doubt be predicated largely on the use of hemlock in log form.

The accompanying table indicates trends of the proportion of species used in western Oregon and western Washington since 1921. In Oregon hemlock has decreased decidedly in relative importance, while white fir and "other species," mostly Douglas fir, have increased. Somewhat different trends are shown for Washington, where hemlock and Douglas fir have increased markedly in relative importance, and Sitka spruce and "other species," principally cottonwood, have decreased.

² Stumpage and Log Prices, H. B. Steer, U. S. Dep. Agri. Stat. Bulletins Nos. 36, 37, 44, 49, and 51.

Year	Western hemlock	Sitka spruce	Douglas fir	White	Others
1921	71%	18%	2%	2%	7%
1925	74	12	2	8	4
1930	74	8	10	5	3
1934	77	7	9	4	3

^{*}Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Data for the years since 1934 are not available as no studies have been made since the figures presented were obtained in connection with another study, but it is felt that the data is still accurate as indicating the general trend in the industry

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Proportionate Consumption of Pulpwood in Western Washington and Western Oregon Form and Species-1921, 1925, 1930, and 1934

		Proportion of Forms			Proportion of Species						
	Region	Year	Total Percent	Cord- wood Percent	Logs Percent	Mill Waste Percent	Western Hemlock Percent	Sitka Spruce Percent	Douglas Fir Percent	White Fir Percent	Other*
Western W	Washington	1921	100.00	18.95	81.05	*****	61.64	18.58	4.82	*****	14.98
		1925	100.00	41.30	47.68	11.02	67.77	18.22	3.47	*****	10.54
		1930	100.00	21.53	34.94	43.53	77.00	5.33	13.90	*****	3.77
		1934	100.00	21.95	65.32	12.73	82.31	3.05	10.17	*****	4.47
Western Orego	Oregon	1921	100.00	7.28	92.72	******	77.85	18.91	*****	3.18	0.06
		1925	100.00	17.80	82.20	******	80.09	5.74	*****	14.12	0.05
		1930	100.00	24.59	67.19	8.22	69.15	14.47	*****	13.58	2.80
		1934	100.00	28.36	69.64	2.00	59.67	19.34		13.38	7.61

* Mostly cottonwood with a little white fir in Washington, and Douglas fir in Oregon.

August Paperboard Output Undergoes Sharp Rise

• Production of paper board in mills in the United States scored a sharp in-crease during August over the month precrease during August over the month preceding, and a larger rise over the similar month in 1938, according to the monthly report issued by the U. S. Bureau of the Census. A total of 443,226 net tons of board of all kinds was produced in August, compared with 366,605 tons in July this year and 358,977 tons in August, 1938, the report reveals. The August output brought the aggregate for the first eight months of this year up to 3,018,869 tons, against 2,420,848 tons in the corresponding period of last year, and 3,094,175 tons in the first eight months of 1937.

Board mills produced at 72.4 per cent of rated capacity in August last, com-pared with 63.9 per cent in July this year and 67.3 per cent in August a year ago. New orders for board received by mills during August called for a total of 454,817 tons, against 382,682 tons in the month before and 361,323 tons in August last year. Unfilled orders held by mills at the end of August were for 119,502 tons, contrasted with 108,427 tons a month previously and 96,635 tons on he same date a year ago.

Waste paper consumed by board manufacturers in August amounted to 314,-316 tons, the report discloses, compared with 255,830 tons in July this year and 264,418 tons in August, 1938, making a

total for the first eight months of the current year of 2,130,903 tons, contrasted with 1,801,162 tons in the same time last year and 2,451,530 tons in 1937.

Stocks of waste paper at board mills at the end of August last totaled 246,219 tons, against 257,889 tons at the end of July this year and 296,070 tons at the end of August, 1938. end of August, 1938.

Minimum Wages Fixed For Pulp and Paper Industry

 On October 4th Secretary of Labor Francis Perkins fixed minimum wages for the pulp and paper industry which af-fects only those employees of companies working on government contracts. The minimum rates are 35 cents per hour in the South, 39 cents in the North and Middle West and 50 cents per hour on

The American Paper & Pulp Association had argued before the labor board that the Pacific Coast states should be that the Pacific Coast states should be grouped with the northern states and a central zone be established between northern and southern regions. It had also argued the need of a tolerance for apprentices and for superannuated and handicapped workers. Miss Perkins said that no such need had been shown in her opinion.

The ruling has practically no effect upon the Pacific Coast industry which has a minimum wage of 62½ cents per hour, as the mills in this region are too far removed from Washington to compete on government paper contracts.

September Newsprint **Production Rises**

● Production in Canada during September 1939 amounted to 253,230 tons and shipments to 267,005 tons, according to the News Print Service Bureau. Production in the United States was 77,309 tons and shipments 78,559 tons, making a total United States and Canadian news print production of 330,539 tons and shipments of 345,564 tons. During September, 27,390 tons of news print were made in Newfoundland, so print were made in Newfoundland, so that the total North American production for the month amounted to 357,929 tons. Total production in September, 1938, was 322,553 tons.

The Canadian mills produced 144,239 tons more in the first nine months of 1939 than in the first nine months of 1938, which was an increase of seven and five tenths percent. The output in the United States was 11,146 tons or eighteen and seven tenths percent more than in the first nine months of 1938, in Newfoundland 33,820 tons or eighteen per cent more, making a total increase of 289,205 tons, or ten and seven tenths percent.

Stocks of news print paper at the end of September were 200,884 tons at Canadian mills and 16,696 tons at United States mills, making a combined total of 217,580 tons compared with 232,605 tons on August 31, 1939.

POSITION WANTED

FORESTER-Now employed as engineer in non-forest industry desires position in woods department of pulp industry. Age 36. Capable of taking charge woods management and pulpwood supply. Reply Box 11, Pacific Pulp & Paper Industry, 71 Columbia Street, Seattle, Wash.

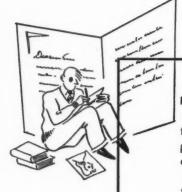
SULPHITE SUPERINTENDENT

WANTED—A man who has a THOROUGH KNOWLEDGE of SULPHITE COOKING, a fair knowledge of acid making and some experience in screening and drying.

This is a good opportunity for a man who is loy-al, sober and industrious, between 30 and 40 years of age, in good health and preferably married.

Address Box No. 12 Pacific Pulp & Paper Industry, 71 Columbia Street, Seattle, Washington.

Quality papers demand quality dyes



THE production of brilliant whites on all classes of paper from bond and magazine to book and writing, requires dyes possessing good fastness to light and yielding a minimum of two-sidedness.

Du Pont HALOPONT* colors are the solution to the problem. They embody the essential properties for this specialized type of application.

> Brightness Instantaneous Dispersion Rapid Development in the Beater **Excellent light fastness Excellent working properties**

They may be added to beater or chest in dry form, developing their full shades in only seven to ten minutes; will not granite or bleed; are unexcelled for glassine shades, as they are not dulled by super-calendering. The range embraces

> HALOPONT Blue GN HALOPONT Blue RN HALOPONT Blue MBXN **HALOPONT Brilliant Blue 2RN** HALOPONT Violet N **HALOPONT Pink 2B**

> > *Reg. U. S. Pat. Off.



E. I. DU PONT DE NEMOURS & CO. (INC.) ORGANIC CHEMICALS DEPARTMENT . DYESTUFFS DIVISION WILMINGTON, DELAWARE, U. S. A.



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Trade___Talk

of Those Who Sell Paper in the Western States

Correcting an Error

• On page 36 of our September number Fred H. Griffith was inadvertently identified as manager at Phoenix, Arizona, for Blake, Moffitt & Towne instead of the Zellerbach Paper Company in that city.

in that city.

Mr. Griffith, who was formerly assistant manager of the Zellerbach Paper Company's branch in Phoenix was appointed manager to replace David Crikelair, who was transferred to other duties with Zellerbach.

Our apologies are extended to the Zellerbach Paper Company and to Blake, Moffitt & Towne for this accidental

William J. Gotthardt Dies in Portland

• On Monday, September 11, 1939, Williams J. Gotthardt, director and paper buyer of Blake, Moffitt & Towne, Portland, Oregon, died following a sudden heart attack. His many friends and associates in the paper industry and printing trade were shocked by the news of

Ing trade were shocked by the hews of his sudden passing.

Entering the employ of the Portland house of Blake, Moffitt & Towne as a young man, he devoted his entire business life to paper merchandising. During his 33 years of service with the company he worked in every department of the business, starting as a warehouseman. His diligence and ability soon qualified him to assume important responsibilities, and he was regarded throughout the trade as one of the best informed men in the business. At the time of his death, he was in charge of all purchases, and was a memer of the board of directors of Blake, Moffitt & Towne of Oregon.

He was an enthusiastic and skilled golfer and was a past director and member of the Oswego Lake Country Club. It was while playing in the state tournament that he was fatally stricken.

Born in Portland in 1887, he was always a resident of that city. He leaves a widow and two sons, David F. and Robert J., who are following in their father's steps in the paper business.

steps in the paper business.
C. L. Shorno, manager of the Portland Division, has appointed R. G. Neilson, Gotthardt's assistant for a number of years, to take over the company's purchasing activities.

Corcoran Paper Expands in Long Beach

The Corcoran Paper Company has opened a new warehouse at 900 West Sixth Street in Long Beach which doubles the space they formerly had.

Hurson Awarded Zellerbach 35 Year Pin

• Robert Hurson, superintendent, San Francisco division, Zellerbach Paper Co., was recently awarded his 35-year pin.

Work Started on New Zellerbach Portland Building

● The construction of a new building for the Portland Division of the Zellerbach Paper Company is underway. It will consist of an eight-story and basement building, adjoined by a two-story and basement building, which can be further developed by the erection of additional floors. When completed a total of 120,000 square feet of office and storage space will be available.

The sales office and display rooms will be entirely separate from the accounting department, and the delivery department is away from both. Considerable attention has been given to the most efficient office planning. Customers desiring to pick up their own merchandise, and pay for it at time of delivery, follow a straight line from the sales department to the cashier and then to the delivery department. Here a special waiting space is provided for their convenience, and an exit leads them immediately to the parking space provided for their delivery vehicle. In this way, the retracing of steps which accounts for the loss of so much time, is entirely eliminated.

The building is out of the congested section of Portland so that adequate parking space is available for customers desiring to make use of the Advisory Department. Receiving docks are separate from delivery docks so as to avoid confusion between incoming and outgoing goods. In addition to a pneumatic tube system, a belt order conveyor will expedite the passage of orders between the sales department and the office. Roller conveyors will supplement spiral chutes for quick dispatch of merchanding from the stale received.

dise from the stock rooms.

The large areas of floor space make possible the centralization of merchandise of a like character within a given area and considerable ingenuity has been exercised in properly planning the stock lay-out.

Modern steel office furniture of streamlined design will be installed and a method of sampling has been developed to make a proper selection of stocks more readily available to custo-

It is expected that the building will be ready for occupancy the end of this year or the first part of 1940.

Coltons Celebrate Thirty-Fifth Anniversary

● Louis Colton, vice-president, Zeller-bach Paper Co., San Francisco, and Mrs. Colton recently received the congratulations of their host of freinds as they celebrated their thirty-fifth wedding anniversary. The Coltons marked the event by taking a trip to Los Angeles.

Nekoosa-Edwards Opens Coast Offices

Nekoosa - Edwards Paper Company announced on the first of October the opening of Pacific Coast sales headquarters in Los Angeles with Marvin A. Vanderheiden as representative in charge. The new offices are at 124 West Fourth Street.

Vanderheiden has been in the western territory for the past several years and has been covering the western states from Salt Lake City west for Nekoosa-Edwards for the past two years. He is well known in the paper industry and is an active member of the Paper Mill Men's Club. Nekoosa-Edwards Paper Company dates from the early seventies and is one of the large eastern manufacturers. Their line includes both fine papers and wrapping papers. The company has mills at Port Edwards and at Nekoosa.

Johnson Wins Wheelwright Contest

● Palmer Johnson, Los Angeles division, Zellerbach Paper Co., was awarded first prize of \$25 from Wheelwright Mills, Leominster, Mass., bristol board manufacturers, for submitting an outstanding printed specimen of bristol board in competition with specimens from all over the United States.

Lillian Fenley Wins Honolulu Trip

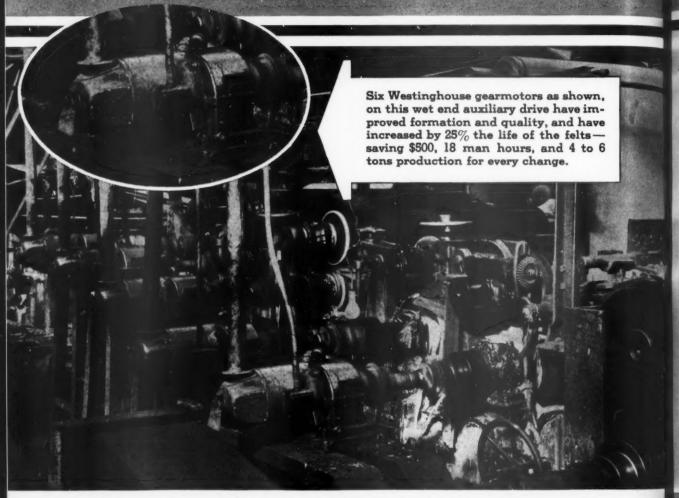
Lillian Fenley, hostess at the Crown Zellerbach booth at Treasure Island got a great big break early last month. After a two-week spell of bronchitis, she returned to work a little wobbly and weak. It happened to be Hotel Day and a drawing was scheduled to see who would be the lucky person to claim two round trip tickets to Honolulu with all expenses paid. Lillian was not especially interested in trips to Honolulu or anywhere else, and she didn't have a ticket . . . but the girl in the next booth did, and she couldn't stay for the drawing. Said she to Lillian: "You take my ticket to the drawing, and if I win I'll take you with me."

Well, the other gal's ticket won, and so Lillian and she will shortly be Honolulu bound.

Macormack Returns From Extended Trip

● T. C. Macormack, Pacific Coast manager, Strathmore Paper Co., is back at his desk in San Francisco after an extensive trip which took him to Portland, Seattle, Denver, West Springfield, Mass., and the New York Fair. Incidentally, Macormack thought that our Golden Gate Exposition had it all over the New York show.

CUTS FELT COSTSI2



IMPROVE PRODUCTION AND CUT COST



SPLASH-PROOF GEARMOTOR

Drives that stand up—regardless of splashing water or other liquids. Electrical parts protected against dripping and splashing liquid. Exact horsepower at the required speed of driven machine, with 96% to 98% of high speed motor efficiency... without slip.

SPLASH-PROOF MOTOR

Built-in mechanical and electrical features—completely protected from dripping or splashing liquids. One-piece frames, moisture resisting Tuffernell insulation, ball or sleeve bearings free from lubrication grief. Save maintenance, keep your machines working.



POWER WHERE AND

WHEN YOU WANT IT.

Westinghouse



Chesapeake Paper Board changes to wet end auxiliary drive with Westinghouse gearmotors . . . saves in felt replacements and steps up production.

Primary press rolls and extractor roll on the wet end of this machine being driven by the felt, resulted in poor formations, short felt life, and high production costs.

In conjunction with Westinghouse engineers, the wet end of this machine was modernized, applying gearmotors to the primary presses and the extractor roll. Results — better formation and quality, lower operating and felt costs, and increased production.

Since the machine has been placed in operation, these wet end felts have a 25% longer life.

This is just another example of the constructive engineering service which is available from Westinghouse to the paper industry. Perhaps similar co-operation can save money for you, too. Ask our local office—or write Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Address Dept. 7-N.

WITH DRIVES MATCHED TO THE JOB



COMBINATION LINESTARTER

One compact package—easily and quickly installed, with complete Nofuze protection for motors and circuits. Saves time, labor, materials, costs less to install than separate starter and breaker units...and saves space.

NOFUZE PANELBOARD

Save on circuit protection — eliminate delays due to unnecessary circuit interruption, saving productive machine time, cost and inconvenience of fuse replacements.



CONTROLS THAT SAVE TIME AND MONEY

ELECTRICAL PARTNER OF THE PAPER INDUSTRY

Fifth Hi-Jinks Sets Attendance Record

N the evening of October 6th the Paper Mill Men's Club of Southern California staged another highly successful party with members of the wholesale paper and twine distributing trade as their guests. The Fifth Annual Sports Carnival and Hi-Jinks was held for the third time at the Riviera Country Club in the hills overlooking Santa Monica bay, and 314 men attended, a record crowd.

ed, a record crowd.

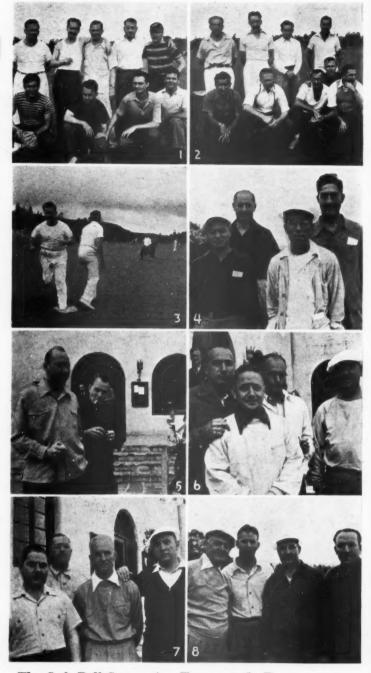
In the special program printed for the occasion the Club said in part, "Perhaps most of you are familiar with the Paper Mill Men's Club, and know that it was originally organized as a non-profit group, for the sole purpose of enabling its members to have a more friendly and better understanding of one another. We are certain that the friendly contacts we maintain through our social gatherings have been productive of much good-will toward our associates in the paper industry.

"Five short years ago today, the members of the Paper Mill Men's Club gave a Hi-Jinks for the first time. This was done to express their sincere appreciation to their common patrons—the wholesale paper and twine merchants. The Hi-Jinks has since become an annual affair. This year we again wish to express our appreciation."

The board of directors and the committee in charge were the wheels that made the party click off so successfully and smoothly. On the board this year are A. C. Hentschel, president, C. Francis Jenkins, vice-president, Charles Spies, secretary, Lester E. Remmers, treasurer, and past presidents ex-officio: Frank R. Philbrook, Ed. N. Smith, Neil B. Sinclair and Geo. C. Wieman. The hard working and deserving committee was composed this year of Paul R. Raab, general chairman, W. A. McBride, vice-chagirman, Harry L. Fields, chairman of finances, assisted by Newby Green and Jerry Madigan; Horace Gibson and Charles Spies, entertainment; Frank R. Philbrook, chairman of golf, assisted by Frank N. Gladden; C. W. Fisher, chairman of door prizes, assisted by G. S. Brenzel; J. D. Tudor, chairman of Christmas fund prizes, assisted by Jerry Thiem, B. Bohnsen, Irvin E. Damon and R. M. Brooks; Art Fox, chairman and editor of the program, assisted by Art Kern and Louis Wanka; and Roy J. Gute, the Judge Landis of the Diamond and chairman of sports and softball, assisted by Marvin Vanderheiden.

Apparently not enough pressure had been brought to bear on the Chamber of Commerce to assure fair weather on October 6th inasmuch as a bit of that which is called elsewhere "Oregon mist," intermittently sprinkled down the ardor of the golfers. Actually golfing paper mill men and their guests, the paper and twine merchants, didn't miss a stroke because of the rain and the customary uniformly good scores were handed in at the end of the tournament.

Just before noon, in a burst of liquid sunshine, the first foursome of the seventysix hardy golfers who entered the annual tournament teed off. There were thirtyseven sponsors and thirty-nine guests. In



The Soft Ball Scores Are Temporarily Even

The soft ball series between the Paper Mill Men and the Paper Buyers now stands at two games each since the mill men won this year's contest 23 to 13 · · · In No. 1, the Paper Mill Men's Team, front row, BILL WEST, VICTOR KRONE, A. E. SIMMONS; back row, BILL CHARBONNEAU, MARVIN VANDERHEIDEN, ROY GUTE, G. S. BRENZEL and PHIL GIRARD · · · In No. 2, the Paper Buyer's Team, front row, BILL HOROWITZ, L. CLARK, BOB WHITING, LYNN OVIATT, R. APPLEBAUM; back row, SAM HOROWITZ, IRA TEMPLETON, HARRY HOROWITZ, and DON PLUMB.

PLETON, HARRY HOROWITZ, and DON PLUMD.

In No. 3, BILL CHARBONNEAU brings home a run as G. S. BRENZEL rounds third . . . No. 4, Y. ARIMA, STAN YOUNT, HARRY HORINUCHI, J. D. TUDOR . . . No. 5, IRVING DAMON and ART FOX . . . No. 6, FRAN JENKINS, DICK JONES, JOE SMITH, and W. J. GRAY in front . . . No. 7, WENDY FISHER, JOHN NEHRES, CHAS. SPIES, PAUL RAAB who was chairman of the Hi-Jinks . . . No. 8, M. J. BORADORI, DeVANE HAMILTON, J. W. GENUIT and J. E. MAURER.

the order of signing the roll, and not in order of foursomes, those playing in the contest were: Frank R. Philbrook, Frank N. Gladden, W. A. McBride, Gary Cann, L. W. Lamboy, B. Brenaugh, G. A. Thiem, Ted Corcoran, A. E. Kern, A. M. Thompson, M. R. Corcoran, Newby Green, C. G. Hulse, George A. Marmion, Russell F. Attridge, A. Applebaum, C. M. Chrysler, F. D. Smith, R. DeHater, J. W. Genuit, Harry Fields, Y. Arima, H. Horiuchi, W. J. Gray, C. H. Smith, Earl Van Pool, C. Francis Jenkins, B. R. Manken, Halsey Lamme, J. N. Peterson, Marcus Ray, J. S. Maurer, Fritz Carman, Paul R. May, M. J. Boradori, D. V. Hamilton, J. D. Tudor, Ed. Haslam, K. Yokanchi, Mike Carter, H. Carter Flinn, Charles Spies, John H. Kehres, Paul R. Raab, C. W. Fisher, George Wieman, C. H. Thomas, Philo K. Holland, Dick Jones, Joe Smith, L. W. Simpson, Walter Johnson, S. G. Yount, C. B. Kerr, W. W. Huelat, J. A. McDaniel, W. E. Webb, R. T. Close, R. A. Corbaley, Carl Fricke, R. C. LeGrant, Don Edmond, Irv. Damon, Harold Sumner, A. A. Ernst, Sam Warner, A. F. Arnold, A. C. Hentschel and A. B. Erlandson. order of foursomes, those playing in the contest were: Frank R. Philbrook, Frank

Golf Winners

• Earl Van Pool, with a net of 69, won the Class A division of the tournament and was awarded, after the banquet, the first prize of a fine pair of golf shoes. C. B. Kerr, with a net of 70, won the Class B division and received a beautiful Class B division and received a beautiful cocktail set. In Class C division Milt Corcoran, with a net of 68, placed first and won a handsome leather toilet set. J. S. Maurer drew the Blind Bogey prize of a five dollar purchase order with a 74. Runner-up position for the Blind Bogey was a three-way tie with J. D. Tudor, Ed. Haslam and J. H. Kehres playing odd man for the prize. Tudor won and received a leather case. For the Select Nine Holes, A. A. Ernst and Al Hentschel tied with 25 net for first place. Hentschel won the five dollar purchase Hentschel won the five dollar purchase order award on a draw, later.

Mill Men 23—Paper Buyers 13

• The Paper League Pennant went this year back to the Paper Mill Men in the hard fought annual soft ball game, with the Paper Buyers. Full nines turned out for both teams this year and a genuine battle was fought for the year's title. The line-up of teams was, Paper Mill Men: Bill West, catcher; Bill Charbonneau, pitcher; Marvin Venderheiden, 1st base; G. S. Brenzel, short stop; Victor Krone, 2nd base; A. F. Simons, 3nd base; I. W. G. S. Brenzel, short stop; Victor Krone, 2nd base; A. E. Simons, 3rd base; L. W. Lamboy, right field; Calvin Richmond, center field; Phil Gerard, left field. Paper Merchants: Don Plumb, catcher; Lynn Oviatt, pitcher; Bob Whiting, 1st base; Harry Horowitz, 2nd base; Sam Horowitz, short stop; L. Clark, 3rd base; Bill Horowitz, left field; Ira Templeton, center field; R. Applebaum, right field.

The pine inpures were filled with fast

center held; R. Applebaum, right field.

The nine innings were filled with fast playing and surprise plays. On the Merchants nine Bob Whiting, one of their heaviest hitters, raced in to complete a run and collided with a man, straining his ankle. Some unnamed hero came to the fore. gave it a tricky mascame to the fore, gave it a tricky mas-sage and Bob was in the game again as fit as ever. Lynn Oviatt banged out a number of fine hits and was no slouch on base stealing. Fastest runner on the team was Don Plumb, who whipped around the bases to bring in a full quota

Roy Gute, impressario of the bout,

did himself proud, turning two bagger hits into home runs with a bit of snappy base stealing. Bill Charbonneau did a

Lou Gehrig and sizzled the balls over the home plate with a close to professional technique. Among the unpredict-



At the Fifth Paper Mill Men's Hi-Jinks

In No. 1, A. GERTLER of New York and J. P. NELSON . . . No. 2, HORACE GIBSON, C. W. CHRYSLER, G. W. THIEM . . . No. 3, KEN SHERWOOD . . . No. 4, A. C. HENTSCHEL, President of the Paper Mill Men's Club . . . No. 5, G. CARLETON, LES REMMERS, GUS SWANBERG, F. C. VAN AMBERG.

In No. 6, CARL SMITH, CARL THOMAS, GEORGE WIEMAN and EARL VAN POOL, winner in Class A of the golf tournament . . . No. 7, NEWBY GREEN, GARY CANN, J. CARTER FLYNN, ROLLA DEHATER . . . No. 8, FLOYD SMITH, FRANK PHILBROOK, R. E. LEGRANT, CARL FRICKE . . . And in No. 9, RUSSELL ATTRIDGE, GEORGE MARMION, HARRY FIELDS, BILL McBRIDE.

ed hazards of the game were the sudden sallies of a small Scotty dog which raced away with the ball at a couple of crucial moments and the rain which kept the boys in a state of speculation as to just how much wetter the grass would get. Final score of the duel of the season was 23 to 13 in favor of the Mill Men, which points to a terrific battle next year when the series tie of two games each will come up for a decision.

Following ball and golf the crowd gathered for dinner. President Hentschel welcomed the guests and thanked the members and friends for their excellent support which had made the event possible. Earlier he had received a wire which he read, as follows: "Please arrange for telephone at speakers' table at eight o'clock. Have important message." Signed by the Executive Committee Midwestern Division Paper Mill Men's Club. The call came through but dinner had been delayed. President Hentschel talked to the members of the committee, who were Dewey Megel, Ken Ross and Bill Heitman, calling from Omaha, Nebraska, to extend greetings to the group and best wishes, and to express their regret in not being present.

Then came the drawing of door prizes. W. B. Reynolds was the official drawer. Wendy Fisher, chairman of the committee, read off the winners and made the awards, which were: Louis T. Mork, Ist prize; Wesley Dodge, 2nd prize. The remaining winners received purchase orders: Milton S. Smith, Ben Abrams, Louis Clark, Bert Vernon, Gary Cann, A. Applebaum, Irv. Damon, J. N. Paterson, Fred Piquet, Ed. N. Smith, D. B. Brinn, L. C. Harden, Henry Horiuchi, Les. Remmers, Bill O'Malley, Philo K. Holland, Gerry Thiem, Walter Huelat, Ed. Haslam, Max Abrams and Don Plumb.

Then the chairman of the Christmas Fund Prize Committee announced the drawing for the various prizes. Miss Gladys Blake of Metro-Goldwyn-Mayer Studios, was the hand of fate drawing the numbers from the large drum. No. 2388 was first, and with this ticket went \$500 to S. Miyada of Los Angeles. No. 3604 was second, giving \$100 to J. C. Mannion of Aberdeen, Washington; ticket sold by Paul Raab. No. 3778 was third, giving \$50 to George Wood of Los Angeles; ticket sold by Lewis H. White. Twenty \$20 prizes were awarded to the following, with seller's name following each: J. F. Fortier by A. A. Ernst, W. R. Lenderking by Bill McBride, W. B. Reynolds by himself, Tom Myers by J. D. Tudor, Vic Alberts by H. D. Elliott, Jenkins by Spies, Dave Gonzola by Geo. Wieman, Homer W. Klein by Spies, I. C. Eshelman by R. M. Brooks, W. R. McHaffie by Les Remmers, H. Nias by Wm. McBride, Leonard Barger by Jerry Madigan, G. P. Grawitz by Harry Fields, Dale Kask by Horace Gibson, W. A. Embleton by Lowell Hambric, W. B. Reynolds by himself (only two-time winner), Larry Bleasdale by Paul Raab, W. B. Willingham by Taylor Alexander, G. Swanes, E. M. Murphy by Al Hentschel, B. H. Richards by Jerry Thiem, and B. H. Harvey by J. A. Weiman.

While the winners were chuckling to themselves and the losers preening their ruffled feathers, the entertainment committee took over and the floor show was launched. Comment was unanimous following this program that this was the best ever and a show the equal of any on the big time. Roy H. McCray pro-

duced it. Mark Cook, who had been the merry master of ceremonies at previous parties, ably filled the role again. Specialty dances, comedy stunts, and musical numbers marked the program.

Following the entertainment the assemblage retired to private games of their own, the ancient indoor sports. And the party continued to the small hours, ending for all a rousing success.

Hosts

 The following members of the Paper Mill Men's Club of Southern California were hosts for the Fifth Annual Sports Carnival and Hi-Jinks:

The Adhesive Products Co., Johnson, Carvell & Murphy; American Lace Paper Co., L. A. Kippes; Angelus Paper & Excelsior Products Co., F. C. Van Amberg, Jack Carson; Bloomer Bros. Sales Cosp., Johnson, Carvell & Murphy; Paper Goods Co. of California, C. E. Digby; E. O. Bulman Mfg. Co., Johnson, Carvell & Murphy; California Cotton Mills Co., Ben Bohnsen; California Cotton Mills Co., Ben Bohnsen; California Fusi Wrapping Mills, Inc., F. O. Fernstrom, J. W. Genuit, D. P. Nichols, J. E. Maurer; California-Oregon Paper Mills, Lewis H. White, Taylor Alexander, Lowell Hambric, J. M. McCord, George McCord; Capital Envelope Co., Ltd., George McNamara, Horace E. Gibson;

© Coast Sales & Converting Co., Edward N. Smith, R. M. Brooks; Comfort Paper Corporation, L. C. Harden, Merle M. Paup, L. F. Anderson; Consolidated Paper Mfg. Co., L. S. Young, S. F. Goldman; Continental Bag Specialties Corporation, I. A. Reiss; Crown Willamette Paper Co., Lester E. Remmera, Newby A. Green, Chester O. Gunther, Wm. R. McHaffie, Stanley G. Yount, R. H. Tily, Ralph Moslander; Crystal Paper Service Corp., Paul R. Rasb; Cupples Company, Charles Spies; Diamond Match Co., G. T. Lyons, J. D. Large; Dixie Vortex Company, Verner Moore, Fritz Carmen, Howard Woodard; The Dobeckmun

Carmen, Howard Woodard; The Dobeckmun Company, Chas. E. Jones, T. E. Bruffy.

• Everetr Pulp & Paper Co., A. A. Ernst; Fibreboard Products, Inc., Walter J. Johnston, J. D. Tudor, L. B. Garlick, Jr., E. Conner; Food Packaging Company, Lee W. Lamboy; Fox River Paper Corp., Gordon Murphy; Graham Paper Company, F. R. Philbrook; Great Western Cordage, Inc., Adin B. Wimpey, R. Hollis Hardy, C. H. Allen; The Gummed Products Co., E. A. Dillon; Hammersley Manufacturing Company, Edward J. Kiefer; Hardwood Products Co., West Coast Coverage Co.; Harvey Paper Products Co., H. O. Bishop.

e Hawley Pup & Paper Co., W. B. O'Malley; Herz Manufacturing Corp., Hygeia Tooth-Pick Division West Coast Coverage Co.; Hoberg Paper Mills, Inc., R. S. Morrill; Inland Empire Paper Co., S. R. Whiting, John E. Whiting; Johnson, Carvel & Murphy, Russell F. Attridge, Garry Carlton, William F. Dryer, Al. C. Hentschel, "Jerry" Madigan, E. M. Murphy, E. W. Murphy, Myrl Carver, Phil Oasian; Kimberly-Clark Corporation, C. Francias Jenkins; Lily Tulip Cup Corporation, W. A. McBride.

e Longview Fibre Company, A. D. West, E. P. Hill; Los Angeles Paper Bag Co., John P. Nelson, S. T. Falk; Menasha Products Co., Roy J. Gute, Ed. L. Haslam; Milwaukkee Lace Paper Co., Jerry Thiem, J. M. Lewis, Wm. Brunaugh; Morgan Paper Company, A. U. Morse & Co. Division, Elmer C. Thomas; Morrison Atlas Products, Inc., National Products Distributors; Nashau Gummed & Coated Paper Company, Neil B. Sinclair; National Card, Mat & Board Co., C. W. Chrysler; National Paper Products Sales Co., Harry L. Fields; Nekoosa Edwards Paper Co., Marvin Venderheiden.

Paper Co., Marvin Venderheiden.

Northwestern Paper Mills, Irvin E: Damon, B. A. Watson; Pacific Coast Envelope Co., Division United States Envelope Co., Louis T. Mork; Pacific Coast Paper Mills, S. G. Wilson, Louis F. Wanka; Pacific Straw Paper & Board Company, Johnson, Carvell & Murphy; Pacific Waxed Paper Co., Cavell & Murphy; Pacific Waxed Paper Co., Charles L. Brouse, Hal. D. Cassaday, Jack Weiman; Paper Manufacturers Co., Inc., Carl W. Draper; Paper Supply Company, C. C. Bolyard; Paterson Pacific Parchment Company, Floyd D. Smith.

Bent Company, Floyd D. Smith.

Pioneer Division of the Flintkote Co., A. E. Carlson, L. M. Simpson, M. C. Larsen, Cliff Johnston, L. B. Miller, L. L. Anderson; Pioneer Wrapper & Printing Company, W. J. Hadley; Pomona Paper Products, Inc., Paul R. May, M. J. Boradori; Rhineslander Paper Co., Edward N. Smith; Thomas M. Royal & Co., C. W. Fisher; Sales Service Corporation, H. T. Phillips, J. H. Levie, S. Clarke; Schermerhorn Bros. Co., A. Bruce Swope, Earl J. Fillier; Silklin Co. poration, W. H. Charbonnesu, "Mike" Carter; Southern Kraft Corp., Frank N. Gladden.

e St. Helens Pulp & Paper Co., F. R. Philbrook: Straubel Paper Co., H. O. Bishop; Tubbs Cordage Co., J. H. Barry: The Tubbs Cordage Co., J. H. Barry: The Tuttle Press Co., Edward N. Smith; Union Bag & Paper Corp., G. S. Brenzel; Veldown Company, Inc., P. E. "Perry" Loer; Western Paper Converting Company, Frank E. Skrivanic, Jack London; Western Waxed Paper Co., George C. Wieman, Walter A. Voltz, Arthur L. Fox, Carl H. Thomas, Arthur E. Kern; Whitlock Cordage Co., Louis A. Brunvold.

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Guests

• The following were invited guests of the Paper Mill Men's Club:

Acme Paper Company, Glendale; Alpha Beta Food Markets, Los Angeles; American Paper Company, Los Angeles; Angelus Paper Excelsior Products Company, Los Angeles; Bakers & Confectioners Supply Company, Los Angeles; J. H. Ball Wholesale Co., Glendale; Barnum & Flagg, San Bernardino; Blake, Moffitt & Towne, Los Angeles, San Diego; Brin Brothers, Los Angeles; Brunswig Drug Company, Los Angeles; Brunswig Drug Company, Los Angeles.

e Buel-Town, San Diego; California Hardware Co., Los Angeles; California Tobacco & Supply Co., Long Beach; California Wholesale Grocery Company, Los Angeles; Canne & Company, Los Angeles; Carpenner Paper Company, Los Angeles; Cash Wholesale Tobacco Co., Los Angeles; Central Paper Company, Glendale; Certified Grocers, Los Angeles; Channel Paper & Supply Co., Santa Barbara; Gien L. Clark Co., Long Beach; Colonial Wholesale Grocery Company, Los Angeles.

© Corcoran Paper Company, Los Angeles, Long-Beach; Eastern Wholesale Grocery Company, Los Angeles; Frank Fernandez Paper Co., Brawley; Fred H. French Paper Co., Los Angeles; Fricke & Peters, Long Beach; General Paper Company, Los Angeles; General Woodenware Co., Los Angeles; Golden State Wholesale Grocery Company, Huntington Park; Great Atlantic & Pacific Tea Company, Los Angeles; Guevara Bros., Los Angeles.

e Haas, Baruch & Company, Los Angeles, El Centro, San Bernardino, San Diego; E. E. Hoagland Co., Ltd., Long Beach; Hollywood Paper Company, Hollywood; Ingram Paper Company, Los Angeles; Interstate Wholesale Grocery Co., Los Angeles; Gordon Jenkins Company, Los Angeles; D. F. Joehnck, Santa Barbara; Juillard-Cockroff Corp., Santa Barbara, Ventura, San Luis Obispo.

Weilly Paper Company, Los Angeles; Klauber Wangenheim Co., Los Angeles, San Diego; Alfred M. Lewis Company, Riverside, San Diego; La Salle Paper Co., Los Angeles; Los Angeles Los Drug Company, Los Angeles; Market Wholssale Grocery Company, Los Angeles; Margnion & Company, Long Beach; McKesson & Robbins, Inc., Los Angeles; Pacific Wholesale Grocery Company, Los Angeles; Paper Products & Supply Co., Los Angeles; Paper Supply Co., Los Angeles.

geles.

e Protecto Products, Inc., Los Angeles; Ralph's Grocery Company, Los Angeles; Rand, Halpin & Hibbler, Santa Maria, Los Angeles; W. B. Reynolds, Los Angeles; Roberts Public Marets, Venice; I. Rudin & Company, Los Angeles; S. E. Rykoff & Company, Los Angeles; Stores, Los Angeles; M. Sakamoto Company, Los Angeles; San Diego Paper Company, San Diego; San Diego Products Company, San Diego; San Diego Products Company, San Diego; San Swelson Wholesale Co., Los Angeles; W. A. Schemian Paper Co., El Centro. e Sherman Paper Products Corporation, Los Angeles; Sierra Paper Company, Los Angeles; Smart & Final Company, Ltd., Wilmington, Santa Ana, Glendale, San Bernardino; Southern California Disinfecting Co., Los Angeles; State Wholesale Grocery Company, Los Angeles; State Wholesale Grocery Co., Los Angeles; State Co., Los Angeles; C

e Taverner & Fricke, Los Angeles; Three Star General Supply Company, Los Angeles; Trade Supply Company, Santa Monica; Union Hardware & Metal Co., Los Angeles; Union Paper Supply Company, Los Angeles; United States Paper Company, Los Angeles; United States Retail Grocers Association, Los Angeles; United Supply Company, San Diego; Upholstery Supply Corp., Los Angeles, Riverside; John Vanderzyl, Riverside.

e Ward, Davis & Dunn, Los Angeles; Wellman-Peck & Company, San Diego; West Costs Supply, Los Angeles; Western States Grocsry Co., San Diego; Western States Supply Co. Los Angeles; Wilson Paper Company, Los Angeles; Weil Paper Company, Los Angeles; Cal Wood, Los Angeles; W. L. Wright & Son, Pomona; Zellerbach Paper Company, Los Angeles, San Diego.

Pells Planning Central American Trip

Rodman Pell, San Francisco paper merchant, and world traveler extraordinary, is now planning another one of his trips to far away lands.
This time he and Mrs. Pell are headed for Guatamala and Nicaragua via Mexico. The Pells will leave San Francisco.

co. The Pells will leave San Francisco
December 15, to be gone until the early
part of February. They will be co-hosts
on a specially conducted tour, which is
being managed by Bruce Thomas, Pell's
lecture tour manager. Another co-host
will be Miss Helga Iverson, travel editor
of "Sunset" magazine.

The Pell's will take along their trusty
color cameras and will undoubtedly bring
beak some movies of rare beauty and in-

back some movies of rare beauty and in-

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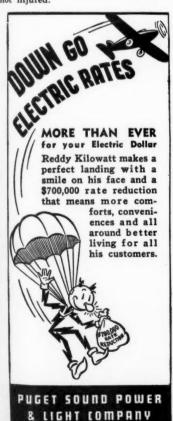
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Melody Joins Staff Of General Paper Co.

· James Melody, who was in the sample division of the technical department of the Crown Willamette Paper Company's mill at Camas, has joined the staff of the General Paper Co. in San Francisco.

Brower Escapes Injury In Train Wreck

 Orlo Brower, Pacific Coast manager, Northwest Paper Co., with headquarters in San Francisco got a thrill early this month. He was a passenger on the Southern Pacific's "Oregonian," which was wrecked when it struck a boulder near Dunsmuir, California. Brower was not injured.



BM&T Men Active In Community Fund Drive

• Mainsprings in the current campaign of the San Francisco Community Chest are executives of Blake, Moffitt & Towne.

Towne.

J. K. Moffitt, president, is treasurer of the Chest and chairman of the finance committee. J. W. Towne, vice-president of the company, is colonel of a division; and his brother, Arthur W. Towne, Northern California manager of the company is chairman of the center. the company, is chairman of the cen-tral committee.

Colton Returns from Visit to Eastern Mills

 Louis Colton, vice-president, Zeller-bach Paper Co., San Francisco, recently returned from an extensive trip to the East Coast. Colton visited mills at Holyoke, Mass., and called on business as-sociates in Chicago, Philadeplhia, New York and Boston. He also attended the Hammermill Paper Co. convention at Eire, Pa. On the way home he vis-ited Zellerbach Paper Co. divisions at Kansas City, Salt Lake City and Port-

nd.
Colton visited the New York Fair, and
is verdict on that was that "it was his verdict on that was that "it was large but not as fine as our exposition on Treasure Island."

Linton Brothers Display **Bristol Board Printing**

• S. T. Orton, Linton Brothers, Fitchburg, Mass., held a most interesting display of advertising matter printed on Linton bristol board at the Palace Hotel, San Francisco, early this month.

There were more than 115 samples of outstanding advertising pleces, cut-outs, etc., printed on Linton bristols, in the exhibit.

Mielke Attended **Paper Trade Convention**

 O. W. Mielke, general manager, Blake- Moffitt & Towne, San Francisco, traveled East for the paper trade convernion in Chicago, then went on to New York. He returned home by way of Los Angeles.

Miss Kelly Editing "Flash"

• "Flash," the snappy and newsy organ of the Zellerbach Recreation Club, is edited by none other than smiling Miss Polly Kelly, who greets visitors to the executive offices of the Zellerbach Paper Co., San Francisco.

Hecht Visiting Zellerbach Divisions

V. E. Hecht, vice-president, Zeller-bach Paper Co., San Francisco, is still in New York but expects to return home shortly visiting the Chicago and Kansas City divisions of the company en-



Mrs. Palm Elected To San Francisco Ad Club

Mrs. Glory Palm, advertising department, Zellerbach Paper Co., San Francisco, was in the spotlight last month at the regular meeting of the San Francisco Advertising Club, when she sat at the head table and took a bow as a new member of that organization.

Bonestell Acquire Mono Cup Line

Bonestell & Co., pioneer San Francisco paper merchants, have taken on the Mono cup line, manufactured by the Mono Service Co., Newark, N. J.

To Attend Everett **Sales Conference**

R. A. Gates, J. E. Horton and A. E. Ernest, San Francisco sales office, Everett Pulp & Paper Co., are planning on attending the company's sales convention at Everett, Oct. 23-28.

Eldredge of Hammermill **Visits Coast**

 Wlibur T. Eldredge, safety paper sales specialist, Hammermill Paper Co., Erie, Pa., is on the Coast on a business trip.

Leddy Vacations In East

The Transition of Transition of Transition of Transition division, Zellerbach Paper Co., recently returned from a vacation trip to the East Coast.

PULP BLEACHING COMPANY

ORANGE NEW JERSEY

CELLULOSE PURIFICATION EQUIPMENT



Slimform from your door.

In over 200 leading pulp and paper mills, the controlled application of chlorine and ammonia—correctly applied with W&T apparatus—has successfully eliminated slime at costs averaging from 1½ cents

to 6 cents per ton of product.

In your mill too, Slimform can be banished—slime losses turned into profits.

The story is told in Research Publication #327
"Slime in Paper Mills—Its Origin and Prevention."
A request on your letterhead brings you a copy without obligation.

WALLACE & TIERNAN CO. INC

Manufacturers of Chlorine and Ammonia Control Apparatus

NEWARK, NEW JERSEY · Branches in Principal Cities
OTHER W&T CONTROL SERVICES:

R ecirculation Difficulties — slime growths in recirculated systems

M echanical Strain on felts and wires—shortened useful felt and wire life

Automatic pM Control Dry Chemical Feeders Bleach Plant Equipmen
Testing Instruments for Chlorine and pM



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National Paper Dyes

TECHNICAL SERVICE

COMPETENT TECHNICIANS IMMEDIATELY AVAILABLE FOR YOUR COLOR PROBLEMS MAY WE SERVE YOU?

NATIONAL ANILINE & CHEMICAL CO., INC.

40 RECTOR STREET, NEW YORK, N. Y.

PROVIDENCE CHICAGO PHILADELPHIA SAN FRANCISCO CHARLOTTE GREENSBORO ATLANTA

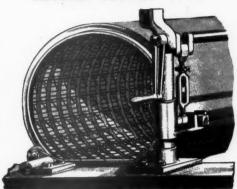
CHATTANOOGA PORTLAND, ORE. TORONTO

BRANCHES AND DISTRIBUTORS THROUGHOUT THE WORLD



DY ROLLS

OPEN END TRUNNION or REGULAR JOURNAL TYPE







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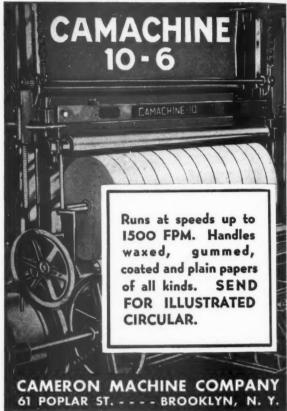


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Of Pacific Pulp & Paper Industry, published monthly at Seattle, Washington, for October 1, 1939.

State of Washington, County of King,-se

Before me, a Notary Public in and for the State and county aforesaid personally appeared Miller Freeman, Jr., who, having been duly sworn according to law, deposes and says that he is the treasurer of the Pacific Pulp & Paper Industry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

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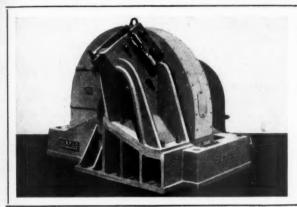
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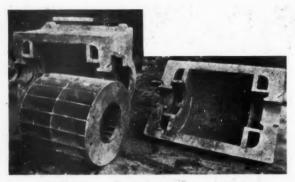
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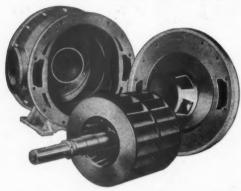
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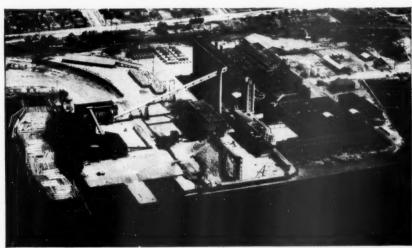
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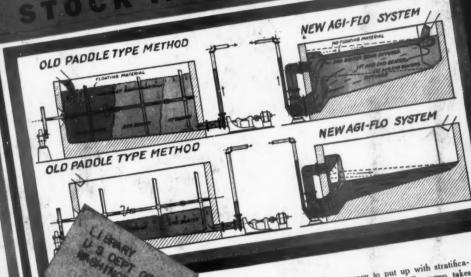


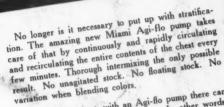
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